

Science Library

Audubon MAGAZINE



in two sections—Section 1

35 Cents

MARCH-APRIL 1946

Bausch & Lomb
7X35 Binocular



So Much To See!

A close-up, clear, sharp view gives you greater pleasure from all sports, travel, nature study. If you want to know the important facts that should guide you in choosing a binocular . . . and to learn of the improved features of *postwar* Bausch & Lomb Binoculars . . . write for our free 32-page booklet of binocular information. Bausch & Lomb Optical Co., 284 Lomb Park, Rochester 2, N. Y.

BAUSCH & LOMB

ESTABLISHED 1853



MAKERS OF

Ray-Ban

SUN GLASSES

Audubon MAGAZINE

(formerly BIRD-LORE)

A BIMONTHLY MAGAZINE DEVOTED
TO THE PROTECTION AND PRESER-
VATION OF OUR NATIVE WILDLIFE

AUDUBON MAGAZINE is published bimonthly by the National Audubon Society in two editions. Subscription price for National Edition (published in one section) \$2.00 per year for the U.S.A., \$2.25 foreign. Single copies 35 cents each. Subscription price for the Regular Edition (published in two sections) \$3.00 per year in the U.S.A., foreign \$3.25. Extra copies of Section II of the Regular Edition may be had at 15 cents per copy for the reports on Fall Migration, Winter Season, Spring Migration and Nesting Season; 25 cents for Breeding Bird Census; 40 cents for Christmas Bird Count. Notice of change of address should be received five weeks prior to issue with which it is to be effective.

AUDUBON MAGAZINE regrets that it cannot continue subscriptions beyond date of expiration. Checks and money orders should be made payable to AUDUBON MAGAZINE. Editorial and advertising offices, 1000 Fifth Avenue, New York 28, N. Y. Reentered as second-class matter April 29, 1942 at the Post Office at New York, N. Y., under the Act of March 3, 1879. Copyright, 1946 by the National Audubon Society.

Postmaster: If undeliverable, please notify Audubon Magazine on form 3578 at 1000 Fifth Avenue, N. Y. 28, N. Y.

DIRECTORS OF NATIONAL AUDUBON SOCIETY: Charles C. Adams, Roger Baldwin, G. Lister Carlisle, Mrs. Francis B. Crowninshield, Gayer G. Dominick, Aubrey Drury, Guy Emerson, Ludlow Griscom, John Kieran, Mrs. Paul Moore, J. J. Murray, Mrs. Walter W. Naumburg, E. Laurence Palmer, Carl Tucker, William E. Wrather.

OFFICERS: Robert C. Murphy, *Honorary President*, Ludlow Griscom, *Chairman of the Board*, G. Lister Carlisle, *Chairman, Executive Committee*, John H. Baker, *President*, Carl W. Buchheister, *Vice-President*, J. J. Murray, *Secretary*, Helen Peterson, *Assistant Secretary*, Guy Emerson, *Treasurer*, Irving Benjamin, *Assistant Treasurer*.

MEMBERSHIP in the National Audubon Society helps to support the cause of protection and conservation of wildlife, plants, soil and water which result in improved public health, greater public happiness, better public economic welfare and higher standards of living.

• Regular	\$ 5
• Sustaining	10
• Active	25
• Supporting	50
• Contributing	100
• Life	200

In this issue

VOL. XLVIII, NO. 2
MARCH-APRIL, 1946

CARNIVAL OF SPRING By Edward A. Hill.....	66
WALDENS FOR EVERYONE By John K. Terres.....	68
THE BIRD AND THE BOOK By Ruth Moore Morriss and Elisabeth Morriss	77
IN COATS OF MANY COLORS By Maurice Brooks.....	82
A BIRDMAN IN INDIA By Fred G. Evenden, Jr.....	92
WONDER WORLD OF BIRD LIFE Compiled by Alan Devoe.....	96
AN EXPERIENCE IN COMPANIONSHIP By C. Raymond Vinten.....	98
BIRDS HAVE ZIPPERS By James R. Sydnor.....	102
CONSERVATION WORKSHOP	105
LONDON BIRDING By Allan D. Cruickshank.....	107
THE PRESIDENT'S REPORT TO YOU By John H. Baker.....	113
THE NATURE OF THINGS (Book Reviews) By Richard H. Pough.....	119
CAN YOU ANSWER THESE? By Anna C. Ames.....	121
LETTERS	122
THE COVER: UPLAND PLOVER By Allan D. Cruickshank	

EDITOR

Eleanor Anthony King

CONTRIBUTING EDITORS

Arthur A. Allen • Henry Beston • Alan Devoe • Ludlow Griscom • Louis J. Halle, Jr. • Margaret Brooks Hickey • John Kieran • Aldo Leopold • Robert Cushman Murphy • Donald Culross Peattie • Roger Tory Peterson • Herbert Ravenel Sass • George Miksch Sutton • Edwin Way Teale

CARNIVAL

By Edward A. Hill

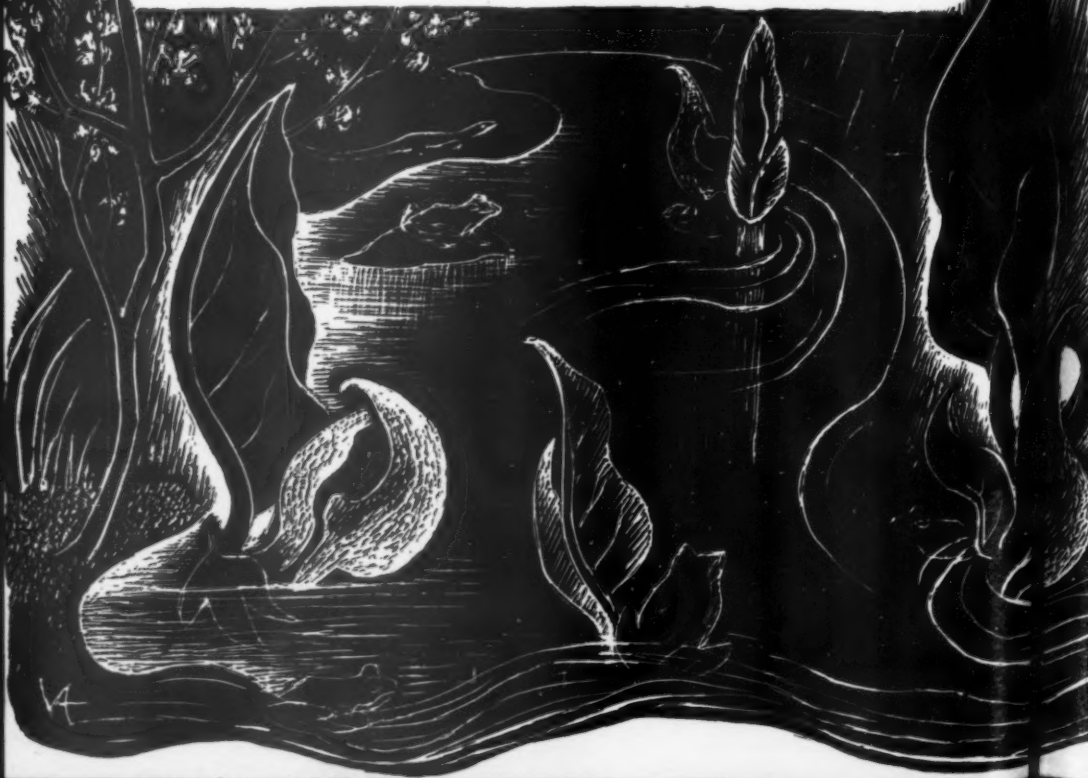
THE little pool was created very suddenly. Trickle of snow water found their way into the small hollow around the spice bush. Successive thaws made the water deeper until the knobs of bunch grass stood out like tiny islands in a miniature lake.

It was midnight by the hoot of an owl when the commotion began. Salamanders slithered into the pool, from every direction. The time for mating had come and the exodus from woods to water was under way.

What a crawling there was everywhere. Heads poked out from under stones as though suddenly remember-

ing an appointment. Spotted bodies writhed free of rotting logs and wriggled along through the leaves till the very floor of the forest seemed to move. It moved with the earnestness of the faithful toward Mecca. Some invisible power, some unifying impulse drew the whole amphibian world toward the little pool. Its waters were the scene of silent ceremony, of amorous coiling and uncoiling, of cold-blooded passion. What tales of love-making the little spice bush could have told.

But the next night the silence was broken. The peepers came out of the woods, hundreds and hundreds of



OF *S*PRING

illustrated by Vera Andrus

them. They jumped headlong into the pool, swimming pick-a-back or singly beneath the surface. The bunch grass islands were filled with them. They blew up balloons at their throats and called across the straits . . . from island to island, from peninsula to shore. The numbers increased and the chorus grew louder until the valley echoed with the din of it.

The chill of dawn brought silence again and spring seemed far away as ever. Then a robin flashed into the spice bush and by noon a black snake was sunning itself on a large flat rock. Skunk cabbage pushed up its purple hood from the bottom of the pool and took honors as the first flower of spring.

Hyla, the frog, came out of the woods that night, and from a lazy, half-submerged position, gave one crackling call. Back it came . . . echoed a thousand times by others of his kind. Soon the bass of the frogs augmented the chant of the peepers in a terrific racket and the carnival of spring was on.

It was like a noisemakers' orchestra on Hallowe'en. In the moonlight the little white balloons of the peepers puffed from every blade of grass. The wooden racket of the frogs sometimes ended in a gurgle of sudden submer-

gence like a death rattle. A stranger might have thought himself beset by devils on every hand for this unseen horde murdered silence with a vengeance.

It went on for weeks, silence by day and noise by night. The salamanders returned to their haunts leaving gelatinous egg-masses like tapioca islands floating in the pool. The future of the race was assured. Frogs, firmly clutching their mates, helped expel long lines of transparent pearls. They too moved landward. The peepers climbed half way up the spice bush and chirped only now and then. One night they left the pool as though their leader had shouted, "To the trees, men, to the trees." Off they went, with the eagerness of scampering monkeys.

Lazy days followed, the soft sun drawing out the buds on the spice bush and warming the eggs of the salamanders. Anemone bloomed on the higher bank and dutchmans-breeches hung in the wind to dry.

The call of the peepers from the distant trees was a melody now. It had rhythm. Though scattered, they stopped and started together as though feeling a need for blending the sounds of night.

Gradually the little pool dried up, tadpoles turned into frogs and baby salamanders crawled up the bank to nose under wet, flat stones. The spice bush threw a gentle shade on the new green grass that grew in the little hollow. The robin made up its mind at last and nested in the highest branch. Spring was really here.



Waldens for Everyone

Landowners building small ponds may recreate some of the charm of Thoreau's legendary Walden.

By John K. Terres

EARLY one spring morning in 1941, a farmer in western New York State was startled at his breakfast table by a strange tumult of wild voices. Parting the neat white window curtains, he looked eastward a few hundred yards to his newly-built farm pond. In the gray morning light he saw something that wrung a shout from him and brought his wife running to the window. A flock of fifty wild mallards and ten Canada geese were swimming about in the shallow upper end of the pond. It was the first time Bob Coles had seen waterfowl on his farm in his lifetime of fifty-eight years.

He told me about it afterwards and I shall never forget the glow in his eyes and the excitement in his voice. If he had discovered oil on his farm he couldn't have been more exultant. He was smiling when he spoke: "I'm beginning to realize what you fellows meant when you said I'd get more out of this pond than water for my cattle!"

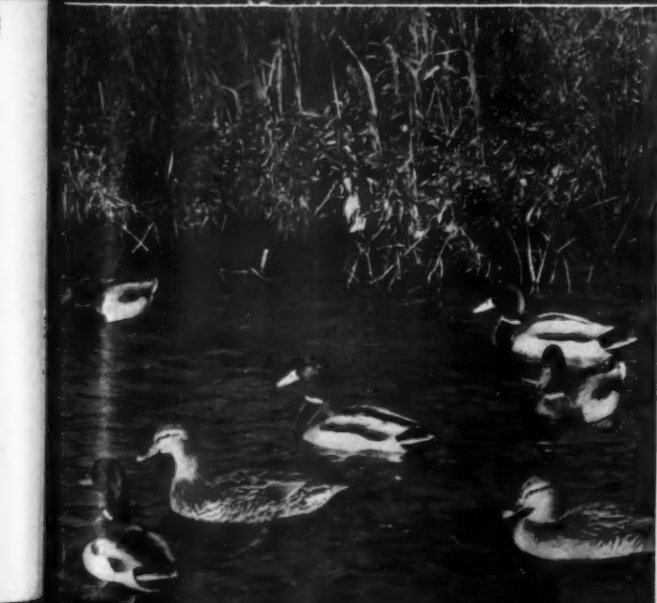
Farmer Coles' story goes back to 1939 when he asked the Soil Conservation Service to help him put soil-conserving practices to work on his eighty-acre farm. I was the biologist



all photographs by Soil Conservation Service unless otherwise designated

called upon to assist a forester, an engineer, and a crop specialist with the conservation plan. We knew from giving practical aid to thousands of farmers that our recommendations would prevent large losses of good farm soil. Furthermore we could, at the same time, help restore a crop of songbirds and other wild creatures to his eroded land. We were to find that every erosion control practice we put into effect would, in some way, benefit wildlife.

The farm lay in a little upland valley. It was rectangular, bounded on the south by a dusty country road,



There is no lovelier sight than a pond with a woodland setting. Here at dusk, the deer may come to drink, and the raccoon, fox and skunk come to seek turtles' eggs, frogs and crayfish. In the foreground, a farmer has planted fruiting trees and shrubs to attract wild furbearers. Persimmons, cherries, grapes, and other wild fruits are readily eaten by the raccoon, opossum, fox and skunk. Below, mallard ducks by Allan D. Cruickshank.

and on the north, east and west by other farms. The cropland sloped steeply southward from a grazed woodland bare of undergrowth, and a property line hedgerow, to a small white farm house and barn near the road. The crop fields were eroded—soil had been washing away with every rain. The farmer had been cultivating his land up and down the slope, unconsciously inviting the rainfall, and with it the top soil, to leave the farm as quickly as possible. To the east of the house, a long trough-shaped pasture extended from the north to the south boundary of the farm. A brushy

watercourse ran the length of the pasture, but it dwindled to shallow pools in late summer. The steep pasture slopes were only sparsely covered with grass. In some places, bare soil was exposed where erosion had worn the thin sod away. The pasture was overgrazed—it needed fertilizer, and a rest.

We planned strip-cropping to protect the sloping fields of cultivated land. The strips of crops would cover the hillsides from top to bottom in *horizontal* bands, each clean-tilled crop strip alternating with a hay strip. Thus rainfall would be kept from racing down the slope, taking a pil-



Birds in the ungrazed New York woods on the left side of fence are more than twice as numerous as in the grazed woods to the right. The dense understory in the protected woods is the home of hooded warblers, ovenbirds, ruffed grouse, woodland jumping mice, shrews, wood frogs, salamanders and other beneficial forest creatures. In an Ohio study, 19 species of birds were found in an ungrazed woodland compared to only 6 kinds in a grazed woods.

Rain has difficulty "running" off this New York hillside (left). The darker colored strips of hay, alternating with corn and small grains, slow the rainfall so effectively that it never has a chance to carry topsoil away. Crop-strips produce more birds by creating more "edges." More varieties of insect food and crop plant cover are available on a field where, previously, only one kind of crop was grown. Note the rock outcrop, planted for wildlife, in the right center of the picture. Farmer's Bulletin 1868, "Wildlife Management Through Soil Conservation on Farms in the Northeast" is a useful reference. Brown thrashers (right) by Eliot Porter.



ferred burden of good farm soil on the first stage of a journey to the sea. Bird-life would be benefited too. On this strip-cropped land we were to find the bird population rising to twice that of adjacent cropland not in strips. Along one of the strip edges crossing half the width of the farm, we planned a low-growing contour hedge. The shrubbery would not only help prevent erosion. It would attract the thicket-dwelling catbirds, thrashers, and other insectivorous birds into open cropland where they could feed on destructive insect pests and carry them to their young.

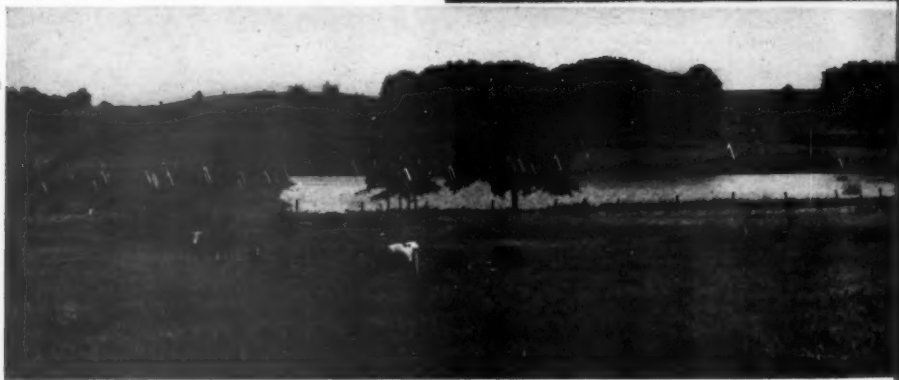
The pasture would be improved by fertilization to thicken the sod. And by fencing it into smaller units and rotating grazing, the over-cropped grasses would be given a chance to rest and grow vigorous again. On the hill above the cropland, a new fence would separate woodland from pasture to protect the woods from grazing. Within a few years, if left undisturbed, the large barren areas under the big sugar maples and basswoods would thicken with new generations of forest trees and shrubs. And with their return would come the birds of

the woodland understory. The forest soil would no longer be packed hard by the dairy herd roving there for a few spears of grass, and a normal population of insect-eating mice and shrews would again burrow their myriad tunnels under the deepening leaf litter. Gradually the hard-packed soil would loosen and absorb the rainfall that had been running out of the woods and spilling over the cropland below. And on another part of the farm there would be a small pond, perhaps more striking in its attractiveness to wildlife than any other development in our conservation plan.

There was an excellent site for the pond in the lower end of the brushy pasture. The stream bed was choked with cutgrass, sedges, and willows. Water flowed there only part of the year, but the supply was sufficient to maintain the pond. The land was wet and unproductive, and lay like a narrow valley at the foot of the steep pasture slopes. It would not have been good economy to build a pond on productive farm land anyway. Our engineer designed a small pond, with an emergency flood capacity, that would do triple service. Not only would it

hold back flood waters from the valley farms below—the pond would supply drinking water for livestock and serve as a wildlife refuge.

The earthen dam was completed in 1940 and backed the waters of the sluggish stream two to six feet deep over an acre and a half of pasture bottom land. Cattle were kept away from the pond. They were excluded by a barbed-wire fence strung at least fifty feet from the edge of the water. They drank of the pond waters piped to a trough below the dam. Farmer Coles sowed grass seeds on the raw banks and on the dam. A grass sod would prevent the waves from cutting into the dam, and from washing soil from the pond banks. Farther up on



the pond slopes he planted trees and shrubs that would provide food and cover for wildlife and keep silt from moving down into the water. Within a few years those trees and shrubs would be tall enough to cast cooling shade on the pond that would lessen evaporation on hot summer days. That was all the planting that was done. But that year saw the beginning of a remarkable transformation.

The pond had been completed only a few weeks when it attracted the first

Ponds are usually built along small watercourses where water is supplied by springs or streams. The water supply may depend entirely on rainfall draining from slopes above the pond, which is highly variable throughout the country. A pond in western New York averaging six feet deep covering an acre of land might require 18 acres of drainage area to maintain it. But in west central Kansas, the same pond might reasonably require a drainage area of at least 175 acres. Differences in rainfall, steepness of slopes, and soil cover and types influence the amount of rainfall reaching a pond from a drainage area.

wild visitors. In the late summer of 1940, muskrats came and built a dome-shaped lodge among the cattails at the upper end of the pond. In the following spring, the wild geese and mallards came noisily to rest there for the first time. After the waterfowl had left, a pair of Virginia rails slipped into the little marsh at the shallow end of the pond. We heard their peculiar grunting and chuckling calls long before we saw them. No one knows when the spotted sandpipers first came, but one day we found them there. A pair stayed all that first summer, teetering and crying plaintively along the edge of the waters over which bank and rough-winged swallows now came skimming. The red-wings had always nested in the cattails of the old watercourse, but two years after the pond was built they had doubled from five to ten pairs. Cattle no longer disturbed their nesting. Three pairs of Savannah sparrows appeared within the fenced sedge meadow, and song sparrows grew from two to four pairs. Meadow larks and bobolinks now nested in the tall grasses that stopped suddenly at the pond fence. In the years before, those grasses had been grazed down to their roots. But on the pastured side of the fence, the killdeers, which prefer the short grass and open cultivated land, still flew in the faces of cattle that stepped too near their eggs.

In the summer of 1941, the first water plants arrived. Perhaps they were always there, growing unnoticed in the stagnant and dying pools of the old watercourse. Farmer Coles thought the wildfowl had brought them on their feet. Perhaps they were washed down the stream bed from farther up the valley. There weren't many that first year—a few floating clusters of the little round-leaved duckweed, (*Lemna*), and submerged clumps of bushy pondweed and water purslane. Bulrushes, sedges, and cut-

Ponds can be a haven for waterfowl (left), but must be fenced to exclude livestock. Grazing and trampling animals will destroy many nests and food plants. Most of the marsh and aquatic plants provide food for wild ducks. Pondweeds, widgeongrass, smartweeds, and bulrushes are eaten by waterfowl throughout the country. Farmer's Bulletin 1719, "Improving the Farm Environment for Wildlife," and Farmer's Bulletin 1879, "Ponds for Wildlife," are useful references. Red-wing (below) by Sam A. Grimes.





Fishing belongs to every growing boy. It is as American as baseball and the Fourth of July. An awakening curiosity in nature may well come alive on the banks of the farm pond. Here frogs, turtles and snakes sun themselves on logs and stones projecting out of the water, and brightly colored damsel flies alight on the fish pole and line. The loud cuckoo-notes of the pied-billed grebe and the "pumping" of bitterns echo over pond and marsh, and swallows and dragonflies skim the sunlit waters. American bittern (right) by Sam A. Grimes.

grass came to the shallows at the pond edge, and on the banks there suddenly appeared a dense growth of barnyard millet, smartweeds, stone crop, wild mint, grasses and shrub willows. And so a few fence posts and barbed-wire wrought their magic. Wildlife nesting cover and food plants came to pond waters and banks because hooves could no longer trample the herbs and grasses. The pond waters stayed clear and unspoiled, and the cattle themselves were less exposed to internal parasites and the dreaded anthrax. Their drinking water was safer in the trough. It could

The entire family may find recreation at the pond. Boating, swimming, picnicking, and fishing may be enjoyed, and in the North, ponds may provide skating and a supply of ice for farm ice-houses. Some ponds may be managed exclusively for fish. Bass and bluegills can be successfully stocked in small ponds. By fertilizing the pond to increase the growth of fish foods, it may produce 150-300 pounds of fish per surface acre annually.



not be contaminated by bovine feet and dung.

Wildflowers, too, came to the fenced pond. Long-stemmed purple violets and yellow marsh marigolds brightened the borders of the pond in spring. And in summer, there were tall, spiky sweet-smelling orchids—ladies' tresses and habenaries, besides the flaming cardinal flower, sky-blue lobelias, white-tufted cotton grass, and pink willow herb. And one day we discovered that this little pasture-marsh might once have been a swamp forest. When excavating for the dam, peat deposits had been uncovered, and in the sedge meadow we found several aged stumps covered with sphagnum, hair-cap mosses, cinnamon ferns, and a dwarfed specimen of the purple twisted stalk.

With the coming of the water plants, animal life swarmed in the pond. Thousands of dragonfly nymphs crawled up the stems of the sedges and cutgrasses. The big-winged adults emerged, leaving their dried pupal husks still clinging to the plants. Farmer Coles called the nymphs "perch bugs," and said they were excellent bait for fish. But the dense mats of bushy pondweed harbored the greatest abundance of water animals. Here we found diving beetles, giant water bugs, pond snails, water boatmen, mites, backswimmers, and water scorpions. And always on the quiet pond surface, the little whirligig beetles spun in dizzy gyrations.

Perhaps the most impressive part of the developing community was the population of meadow frogs. Both *Rana pipiens* and *palustris* were there in thousands. If one walked in the sedges near the shore line they skipped across the shallows like stones thrown by small boys, driving in hordes to the safer depths of the pond. One day a pair of bitterns arrived with a little green heron. I think they knew of the frogs that swarmed there



Dams are sometimes built with a team. This method may be less expensive than using a bulldozer or other heavy equipment, but it is much slower. Its chief disadvantage lies in the increased threat from sudden rainstorms. These may occur during prolonged construction periods, damaging the partly completed dam. Small farm ponds or reservoirs should not be contemplated before reading Farmer's Bulletin 1859, "Stock-Water Developments," or some other authoritative reference.

before we did. And when the first snows of 1941 fell, eight muskrat lodges had been built in the cattails at the head of the pond.

Today Farmer Coles is a much happier and more contented man. His soil seldom muddies the valley creek below. The non-grazed woodland, poised above the cropland, is gaining the absorptive capacity of a huge sponge. Strip-cropping, contour cultivation, and denser pasture grasses hold topsoil and moisture on the land. A million tiny ridges wrinkle the cultivated slopes where the plow and the cultivator have flung them up. Like tiny barriers, each fights a delaying action against gravity, each checks the rainfall from the swift scouring flight that may wear the productive soil

away in one or two generations. Rainfall is now given pause; it is delayed and detoured; it has more time to soak down into crop roots. And the farm crops have responded to the increased moisture, for more corn, wheat, hay and pasture are produced on each acre of land.

But the Coles farm is also far more habitable for useful kinds of wildlife than before. With the coming of soil-conserving practices, birds have come back to bird-lean acres throughout the farm. On cropland they have doubled their forces against the insect enemies of farm crops. Within the once-grazed woodland, birds, forest mice, shrews, and small game animals have made a startling comeback. The farm pond is a refuge for more than twenty species of birds. There are more kinds of birds there than in any comparable area on the farm. And the pond will even give Farmer Coles fire-protection, for he now has a large quantity of water available if a fire occurs.

The muskrats are a thriving colony from which the neighboring farm boys trap a few each year. The wild ducks and geese come each fall and spring, for Mr. Coles allows no shooting on the pond. The pied-billed grebes came and nested again last year. Wilson's snipe stop in spring to probe the wet borders of the little marsh. The pond is stocked with fish and in summer, the kingfishers and great blue herons come with the bitterns to enjoy the open fishing rights. Farmer Coles wants them to have their share. Last year a pair of mallards stayed and nested in the sedge meadow. That was a crowning development, far beyond the expectation of this kindly farmer. He was beginning to reap a new product of the land—one that brought joy with every season. He had sown a crop of birds and the harvest was rich and unfailing. If you ask him, he will tell you

that he owes it all to an acre of water and a roll of barbed-wire.

Can others do as Farmer Coles did? The Soil Conservation Service has the answer to that question. Up to the fall of 1945, they had helped nearly 40,000 landowners build farm ponds. In Missouri alone, farmers have built 30,000 ponds for flood-water storage, livestock watering, and fish and wildlife production. They plan to build 500,000 of them. The Soil Conservation Service has found that small ponds with earthen dams cost from \$150 to \$300 to build. Construction costs will vary according to the kind of equipment used, the pond site, and the materials of the dam. In most places, ponds are built with bulldozers or other heavy equipment, but they may also be built with a team which reduces the cost. Earthen dams are probably the cheapest and concrete dams the most expensive to build. In Missouri, ponds from one-fourth an acre to half an acre, and from eight to ten feet deep are recommended. These have cost from \$50 to \$200, and the average cost has been \$127. There are many government and state bulletins and circulars giving explicit directions for the construction of small ponds. Water areas for waterfowl or fish are within the reach of anyone owning a piece of land with a water supply and a suitable site.

I remember the last time that I saw Farmer Coles. It was just a few weeks before I left to go into the Army. We were standing near his barn watching a flock of Canada geese resting on the pond. "You'll come back," he said prophetically. "Just like those fellows down there that return to me every year." He turned to me with a smile. "Tell them something for me. . . ."

"Tell who, *what*?" I asked in surprise.

"Tell *anybody* that if they want to get a new interest in life—just build themselves a farm pond!"

THE BIRD

AND



THE BOOK.

By Ruth Moore Morriss and Elisabeth Morriss

Illustrated by Gillian Quennell

That's the wise thrush; he sings each song
twice over,
Lest you should think he never could re-
capture

The first fine careless rapture!

The wise thrush is as familiar to us
as the lines with which the same poem
opens, "Oh, to be in England, Now
that April's there!" But how many of
us know the lines are Robert Brown-
ing's "Home Thoughts from Abroad?"

Then there is "Hark! hark! the
lark." I was asked the other day who
first made that phrase famous. "Keats
. . . well, then, Shelley!" I said. When
I looked up the reference I was
ashamed. In school I had to copy the
lines often enough to know every
comma:

Hark! Hark! the lark at heaven's gate sings,
And Phoebus 'gins arise,
His steeds to water at those springs
On chaliced flowers that lies;
And winking Mary-buds begin
To ope their golden eyes;
With everything that pretty is,
My lady sweet, arise.

Not Keats nor Shelley—Shakespeare
himself. On behalf of my ignorance,
let me add quickly that it is from one
of the less known, less quoted Shake-
sperian plays. Yet, "Hark! hark! the
lark" has made itself as much a part

of our everyday language as "To be,
or not to be?"

This illustrates a curious fact about
birds in books. Long after a poem,
play, or a book is forgotten, a particu-
lar bird will still stand out as a bright
symbol. From Shakespeare, to nursery
rhymes, not forgetting Coleridge and
Poe, birds have taken over the stage,
and the written page. It would almost
seem fatal for a writer to refer to
them. Some of them are so much more
famous than their sources—or the poor
authors.

Who, for example, realizes that
early in the seventeen hundreds,
Bishop Thomas Percy put into print
the mournful lament, "Willow, wil-
low, willow!" in his collection of old
ballads? It took those two master pub-
licity agents of fun and rhyme, Gil-
bert and Sullivan, and a bird, to make
the words unforgettable. They created
little tom-tit (instead of Bishop Percy's
sorrowing knight):

On a tree by a river a little tom-tit
Sang "Willow, titwillow, titwillow!"

Birds have winged their way
through the literature of all centuries,
and all countries. They have added
beauty, metaphor, song, and supersti-

tion. Naturally writers haven't been able to keep up with this timeless flight. If they (the writers) don't get lost in their own dusty pages, they are apt to repeat each other's words and phrases, sometimes deliberately borrowed, but sometimes by an unconscious repetition of simile used hundreds of years before.



Owls
to
Athens

Take the owl. Diogenes mentioned his wisdom about the third century of the Christian Era—a long while ago. This was not the Diogenes who went about looking for an honest man, but Diogenes Laertius, who wrote ten volumes on the life of the philosophers. His exact phrase was, "Like sending owls to Athens,"—that being the center of wisdom (an earlier version of "bringing coals to Newcastle.") It is doubtful if many writers have used the ten volumes as a source, but they have been referring to the wise old owl ever since.

You can scarcely blame them, when birds made immortal by prose and poetry run into the hundreds. The eagle probably tops the list with at least two dozen well-known quotations, not counting innumerable biblical references. Any unknown bird in biblical times might be called an eagle: "The way of an eagle in the air; the way of a serpent upon a rock; the way of a ship in the midst of the sea; and the way of a man with a maid." This appears first in the "Book

"willow,

tit-

willow,

tit-

willow"



of Proverbs." Then in "The Long Trail," Kipling says:

There be triple ways to take, of the eagle or the snake,
Or the way of a man with a maid;
But the sweetest way to me is a ship's upon the sea
In the heel of the North-East Trade.

Robin redbreast is another favorite. So are swans. The loon seems to have been neglected. The dodo seems to come out most prominently in "Alice in Wonderland." But to hark back to the lark, there are at least seventeen famous quotations about this bird, beside Mr. Shakespeare's. In fact, whether we like it or not, birds fly away with our words.

Mr. Poe's raven is a sad example of what a bird can do when he puts his mind to it. "The Raven" was supposedly a lament for the Lost Love, Lenore. But does anybody, unless he is a student of Americana, and of Edgar Allen Poe, remember her? It is the raven, tapping, tapping at my chamber-door. The raven, who perch'd upon a bust of Pallas. The raven who has all the speaking lines in the piece. "Quoth the Raven, 'Nevermore!'" Those are the lines which have echoed through Poe's fame.

Another example of base ingratitude is the albatross. Has the ancient mariner a chance? Well—possibly a ghost of one. Fragments of stanzas

come back: "The Wedding-Guest here beat his breast." . . . "Water, water, everywhere, Nor any drop to drink." But above those hot bright seas, or in the realm of ice and snow, the albatross is just offstage like Hamlet's ghost—or else he's right on deck!

Coleridge—just to give an author some credit, for a change—made the albatross a bird of superstition. Apparently the raven had been one from early times, which Poe brings out in his poem. "Thunder on the left," meant to the ancients that they must stop and listen for some pronouncement of the gods. A raven on the left was just as portentous, and far more ominous. He boded no good. Plautus, about 200 B.C. said, "It wasn't for nothing that the raven was just now croaking on my left hand." John Gay, in "The Farmer's Wife and the Raven," was even more explicit:

That raven on yon left-hand oak
(Curse on his ill-betiding croak!)
Bodes me no good.

To leave these legends of evil, as Mr. Kipling would say, or rather, of ill-omen, the robin is supposed to be a bird blessed. According to three time-honored legends, quoted below, there are three different reasons why the robin should hold such a high and warm place in our affections. His kindness to the children in the wood is mentioned in Thomas Percy's "Reliques of Ancient English Poetry:"

No burial this pretty pair
Of any man receives,
Till Robin Red-breast piously
Did cover them with leaves.

The other two legends explain his coloring. From "Carmarthenshire Leg-



The Owl and the pussycat—

end of the Robin" we have this: "Far, far away, is a land of woe and darkness, spirits of evil and fire. Day after day, a little bird flies there, bearing in his bill a drop of water to quench the flame. So near the burning stream does he fly that his feathers are scorched by it, and hence he is named 'Bron-rhuddyn'—breast-burned."

And here is William Crosswell Doane's version of robin redbreast:

Sweet Robin, I have heard them say
That thou wert there upon the day
That Christ was crowned in cruel scorn,
And bore away one bleeding thorn;
That so the blush upon thy breast
In shameful sorrow was imprest,
And thence thy genial sympathy
With our redeemed humanity.

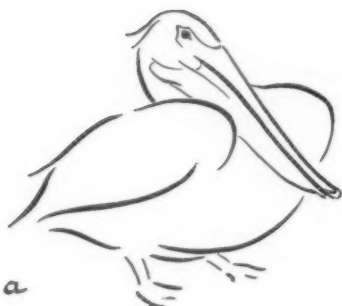
Of course in the nursery, robin has always been favorite, although the first murder mystery surrounded him.

"Who killed Robin Redbreast (alias Cock Robin)?" Fortunately a suspect quickly admitted the crime. "I," said the sparrow. "With my bow and arrow—I killed Cock Robin!" So there were no sleepless nights, no

"Who killed Cock
Robin?"



"I"
said
the
sparrow



a remarkable bird is the Pelican

waiting, no watching. The mystery had been solved.

Next to this account of Cock Robin, in quality of suspense, is the "Owl and the Pussy-cat" who set off to sea. There is the perfect adventure story, with the pussy-cat (if he is depicted properly) looking wistfully home from the waves. Add to these two classics, "Four and Twenty Blackbirds Baked in a Pie"—which we understand was actually served before the days of bird conservation. But children did not understand there was anything cruel about a blackbird pie. For them, when the pie was opened, the birds began to sing.

The pelican and his belican held no social significance, except that there was plenty in the land—or certainly in the water. Neither did "Goosey, Goosey Gander."

Children love these birds. They still love them. That is their importance. But we can't trace the first nurse, or seer, or mother, who related their histories, except for the "Owl and the Pussy-cat" whose author is Edward Lear. He wrote

There was an Old Man with a beard,
Who said: 'It is just as I feared;
Two Owls and a Hen
Four Larks and a Wren
Have all built their nests in my beard.

Along with Lear's enchanting nonsense should be mentioned that light-hearted verse by William Ernest Henley, famous English dramatic critic,

who collaborated with Robert Louis Stevenson on a series of plays;

The nightingale has a lyre of gold,
The lark's is a clarion call,
And the blackbird plays but a boxwood flute;
But I love him best of all.

The Irish Katharine Tynan Hinkson says almost the same thing:

There's a lark in the noon sky, a thrush on the tree,
And a linnet sings wildly across the green lea,
And the finches are merry, the cuckoos still call,
But where is my Blackbird, the dearest of all?



Goosey

Gander

Upstairs and downstairs

The other day I was in the Metropolitan Museum of Art. I saw one of their old, rare books, a copy of the "Thousand and One Nights." There, illustrating the story of Sinbad the Sailor, was the claw of the Roc, covering almost an entire page. It brought back Sinbad, with the Old



the roc
who
didn't know
his
own
strength

Man of the Sea on his back (how that had harrowed my days and nights when I was young); Sinbad looking over the valley of diamonds and coveting the glittering wealth below him. But there was no way to clamber down the steep declivity. Then the hero of the tallest of tall tales be-thought himself of the Roc. He flung chunks of meat down. The Roc, lured by the bait, flew back with meat. The diamonds were stuck fast to it. A wonderful bird of Eastern fable, the Roc! According to the encyclopedia he was large enough to lift an elephant.

The other, actual bird of the East, so frequently mentioned, is the peacock. In the tombs on the Nile one sees frescoes showing peacocks parading in the gardens of the Pharaohs. Centuries before King Tut's time, the Egyptians built the first fleet in the world. That fleet went to Punt, in Africa, and brought back saffron, lip rouge, ivory, apes, and peacocks!

One of the most often repeated phrases on birds we find first in the "Book of Kings":—"Once in three years came the navy of Tharshish, bringing gold and silver, ivory, and apes, and peacocks." Then in "The Merchantmen" from Rudyard Kipling:

King Solomon drew merchantmen
Because of his desire
For peacocks, apes, and ivory,
From Tharshish unto Tyre.

And in "Cargoes" from John Masfield:

Quinquireme of Nineveh from Distant Ophir,
Rowing home to haven in sunny Palestine,
With a cargo of ivory,
And apes and peacocks,
Sandalwood, cedarwood, and sweet white wine.

This, however, is no unconscious repetition of thought after centuries. There is beauty in the sound of ivory, apes and peacocks—adventure. That richly worded passage from Kings has furnished inspiration for the title of



there
was
an old
man
with a beard -

books, and for their writers in all times.

Peacocks have flaunted their imperial gold and green tails through literature. The Phoenix has risen again and again from his fabled ashes. Shelley has made immortal "Hail to thee, blithe spirit!" in "To a Skylark." Blackbirds whistle across page after page. Jenny Wren builds her nest, not once but any time in the year an author would like to remember Spring. All our geese have been swans, and vice-versa, until Matthew Arnold tried to settle the matter once and for all: "Let the long contention cease! Geese are swans, and swans are geese." That he calls "The Last Word!"

But what a bitter last word if the trumpeter swan, as in Chaucer, were to sing his last song, or, as Keats predicted in "La Belle Dame Sans Merci" . . .

"And no birds sing."



In Coats of Many Colors

By Maurice Brooks

ONE of the earth-scientists—I think it was Bailey Willis, the dean of them all—remarked, “My friend hears ten bird songs where I hear none, but I see color and beauty, form and meaning in the stone which he stumbles over.” I am sorry that Professor Willis does not hear the songs of birds, but in his perception of color and beauty, and from that to form and meaning, he is dealing with fundamentals.

In my experience with those who are just beginning to be aware of birds, I find that few become interested in birds through hearing their songs; in fact, the average individual is scarcely conscious of bird music until it is called to his attention. Neither is the flight of birds, marvelous as that power may be, likely to kindle enthusiasms in the casual observer. But color—there is the touchstone to

Black-throated green warbler by Eliot Porter



genuine attention and interest!

I like to take a group of more or less indifferent students into the field during early May, to sit down quietly near a tangle of blooming dogwood and crab-apple, and to watch what happens when they see for the first time a redstart or a magnolia warbler. Here in these feathered mites is color and beauty such as they had not imagined, never having really looked before at a bright-plumaged bird. To these students birds will never again be dull, uninteresting, nondescript. They may never become serious ornithologists, but all will have lasting impressions of rich and pleasing color and the memory of a few birds, at least, that have become individuals.

And yet many of us who look at birds are content to take their colors for granted, without questioning the why and wherefore. The pigments are present (or at least we think so), and we leave to the biochemist the study of those pigments, just as we leave to the animal breeders the problems and complexities of color inheritance. Journals of ornithology have singularly few articles which deal with bird coloration, or mention it in more than a passing way. Certain of the standard books about birds have chapters on coloration, some of them excellent, but this information seems not to reach the average bird student who is puzzled about the albino which appears at his feeding shelf, or about the reddish-brown and gray screech owls which he finds in a single nest.

Out of curiosity I have recently examined the indices of *The Auk* over the years from 1886 to 1945. In this sixty-year run there are exactly five indexed references to albinism (the absence of pigment); one to melanism (the intensification of dark pigment); and none at all to erythrism (the intensification of red), or xanthochroism (the abnormal tendency toward yellow color).

Not a single article or note is indexed under "pigment" or "pigmentation." Evidently bird students can take their "color" or leave it alone.

Color as we see it and pigment as it exists chemically are not at all the same thing. This is just another expression of the old saying, true of birds as of other matters, that things are not always what they seem. It is good fun to tell a group which has just been watching a blue jay or an indigo bunting: "I'm sorry, but you were mistaken when you thought you saw blue on that bird; there is no blue pigment in its feathers." At first they think you are joking; then, when convinced that you are serious, they become frankly skeptical. That's your chance to bring out the distinction between pigment and color.

Nature has an amazing way of taking a few elements (I don't mean that in the chemical sense of the word) and weaving them into intricate and seemingly endless combinations. Thus she starts off in the lower vertebrates, the fish, with three fundamental pigments, brown, red, and yellow; blending them, combining and re-combining until we have the rainbow brilliance of the reef fish in tropical waters. Obviously there are other colors in the fish, iridescent blues and greens, but these are due not to pigments present but to the effects of refracted light from crystals of guanin (a protein waste product) just beneath the skin surface.

Once having fixed on a pigment pattern for vertebrate animals, nature continues it, with some relatively minor, but highly interesting, side excursions, through the amphibians and the reptiles to birds and mammals, even to man himself. Brown, red, and yellow, these three and usually no more, are the basic pigments from which the coloration pattern is woven. In birds as in fish there are of course blues and greens, but these are, for

Brown, red and yellow are the basic pigments from which the coloration pattern of birds is woven — how, then, do you explain the blue of the blue jay and the blackness of the turkey vulture?



Allan D. Cruickshank

the most part, light effects, the results of refraction from certain arrangements of crystalline rods or prisms. Green pigments and blue pigments do occur, but are exceptional.

Without going into involved chemical details, let us look briefly at these three fundamental pigments. The most common one is called *melanin*, and produces brown or black in animals. There is some dispute as to whether it is brown or black; likewise as to whether the melanin of birds is the same as that in other vertebrates.

Without exploring these points of difference, it can be said that every bird student knows a part of the answer—birds which appear to be, and are commonly called, black in life are found to be brown when examined closely. A crow or a turkey vulture looks black, but this is brown intensified. Shading and intensity depend on the number and grouping of the melanin-pigmented cells—the more there are (near the surface at least) the darker will the animal's fur, feathers, or skin appear.

Melanin occurs in varying concentrations in the skin of human beings.

Eye color is due to melanin; whether the eyes are blue, green, gray or brown depends on the number and arrangement of the pigmented cells.

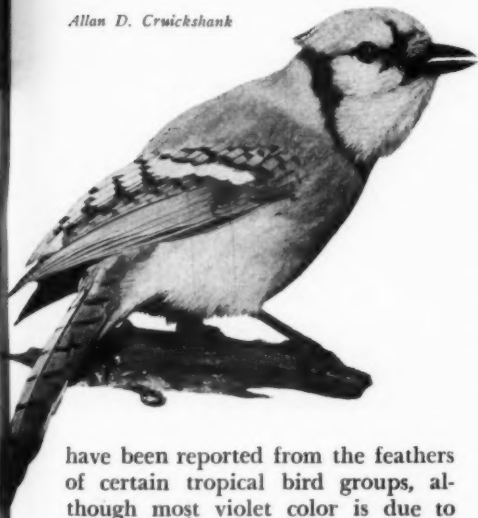
The yellow pigment, found in all classes of the vertebrates, is *xanthin*. Xanthin pigments (with slight variations in chemical make-up) also occur in plants. This pigment is responsible for the yellow sides of a bluegill, the stripes on certain salamanders, and the over-all color of a yellow warbler. It occurs (also in varying proportions) in the skin of human beings. Yellow flowers and seeds in plants are due to xanthin.

Erythrin is the pure red pigment of living things and again there are slight chemical variations as between plants and animals. It is abundant in the red blood cells of vertebrates, and gives color to the red feathers of a cardinal or a scarlet tanager. This red pigment is common in plants, and sometimes shows up with results that will be recalled with pleasure by those who have some rural background. Once in awhile normally yellow field corn produces a red ear, the xanthin in such cases being replaced or masked

by erythrin. At the old-fashioned husking bees (of blessed memory!) the corn husker who found a red ear might, with complete propriety, kiss the girl of his choice.

According to authorities quoted by Dr. Glover M. Allen, there are two other relatively rare pigments in bird feathers. One produces the vivid green feathers on the African plantain-eaters, and is called *turacin*. It is remarkable in containing a much higher proportion of metallic copper (7%) than is known from the plumage of any other birds. Violet pigments, also,

Allan D. Cruickshank



have been reported from the feathers of certain tropical bird groups, although most violet color is due to structural arrangement within the feathers rather than to pigmentation.

It is interesting to trace the appearance of the three fundamental pigments, brown, yellow, and red, through a large and widely-distributed family of birds, the finches (*Fringillidae*). Apparently the brown pigment, melanin, is basic. Most of the adult sparrows, and most young birds throughout the entire family, have more or less brown in their plumages. It can be fairly assumed that the finches began their development as a group of rather plain brown birds.

But such drab raiment has not sufficed for these birds. Many of them have evolved toward brighter hues, and along remarkably parallel lines. Some, such as the male cardinal, have achieved a startlingly bright shade of red. The male purple finches, plainly striped in brown when young, have taken on an erythric wash, as have the redpolls, the rosy finches, and the crossbills. In some the evolution (thus far at least) has been toward yellow. In this group we have the American goldfinch and the evening grosbeak. Among some species the males have achieved the red coloration, while the females have tracts of yellow in their plumages. Pine and rose-breasted grosbeaks and red crossbills are notable for this tendency.

Various authors have used the siskins and goldfinches of America and Europe, close avian relatives, to point up this evolutionary trend toward plumages which make greater use of erythrin and xanthin. The American pine siskin is a striped brown sparrowlike bird with flashes of yellow in wings and tail. Its European counterpart is much more strikingly colored, with wings and tail about half yellow. Skipping back to this side of the Atlantic, the eastern goldfinch is a vivid yellow-and-black bird without any streaking. Finally, the European goldfinch, seemingly farthest advanced along this line of development, is a yellow-and-brown bird with a bright red patch on the face. Perhaps these four closely-related species epitomize the course of fringilline evolution.

Anyone who thinks about the matter will recall that some birds have no pigmented feathers, but are pure white so far as plumage is concerned. It seems perfectly right and proper to us that American and snowy egrets, and white ibises, as well as adult glaucous, Iceland, and ivory gulls, should have white feathers. The rub comes when we see a single *pure white* robin



Young western chipping sparrows (photograph by R. and H. D. Wheeler), eastern goldfinch (by Eliot Porter) and cardinal, below, (by Allan D. Cruickshank). Did the whole finch family start out as a group of plain brown birds?

among a flock of robins! An egret may be white within the bounds of propriety, but a robin is not.

The white robin, if white enough, may be, and very likely is, an albino. Since not all white birds are albinos, we had better define the word. In strict terms an albino is a living thing, plant or animal, wholly lacking in pigment. That means hair, feathers, skin, eyes in animals; and leaves, stem and flowers in plants. It may seem a contradiction to say that true albinos must have pink eyes, but that is apparent rather than real, since the pink coloration is due to the presence of blood capillaries, unmasked by any pigment, near the eye surface.

The physical chemists tell us that the presence of pigment in any living thing is dependent on at least two factors (perhaps others as well). These two primary requirements are color bases (*chromogens*) and enzymes to act upon them. When both are present, and when they interact properly, colored products (pigments) result. If either is absent, or if the two do not interact, an albino results.

Albinos result from a primary mutation, and, genetically, the characteristic is a recessive, which means that if an albino mates with a normal individual (so long as that normal-appearing individual is not itself carrying the concealed factors for albin-



ism) no albinos will appear in the first generation offspring, but may in the second. All of which is ABC-stuff to the scientists, but may be a bit involved for the layman who hasn't brushed up on genetics recently.

To go a step farther, it must be clearly understood that pigmentation, or the lack of it, in an organism is due to the interaction of a number of different inheritance factors which are called *genes*. It may be impossible to say just how many genes will be concerned in the color inheritance of different species, but the number will certainly vary from species to species, and may be quite large. Now these color genes, many of them at least, may or may not act independently, so that an almost infinite variation in color detail is possible.

In the cases of the true albino *all* color factors have failed to act, but this is a relatively rare situation. Much more common are the so-called "partial albinos,"—something of a contradiction in terms, and rather like saying that a ball is partly round. Webster's dictionary recognizes the common usage, however, and regards as albinos those plants and animals which are abnormally white in only a part of their outer covering. "Partial albinos" are relatively common among some species of birds—robins, house sparrows, and some of the true sparrows particularly.

Some birds will have only a few abnormally white feathers; others may have a symmetrical design in white on either side of their bodies; still others may present a mottled white and dark appearance; the variations are countless. Remember that this abnormal condition may be the result of the failure of one or more color-determining genes to function properly.

Returning to the egrets, the white gulls, and other birds with naturally unpigmented feathers—they are not albinos. They have normally pigmented

eyes, and usually have true pigment in legs and bill. They have normal powers of vision, whereas albinos, lacking eye pigment, have weak and uncertain vision, and are therefore in the doubly disadvantageous position of being more conspicuous than their pigmented brethren, and less able to sense the dangers which are certain to threaten them. Furthermore, when white feather coloration (a loose and inaccurate phrase, but hard to avoid) is the normal thing, it is a dominant characteristic, genetically speaking, and the birds will breed true to type, something which does not happen among albinos.

Albinism occurs among all living things. In green plants it is usually fatal, since the plant must have the green pigment, chlorophyll, for the production of its own sustenance. Ordinary field corn is subject to albinism, and W. C. Legg tells me of a cardinal flower (*Lobelia cardinalis*) that was almost pure white throughout. I have seen a trillium (*Trillium grandiflorum*) which was pure white throughout, save for the narrowest of green segments in one of the leaves.

Not all white plants are albinos, however. Some—the familiar Indian pipe is an example—take their food from other organic matter instead of carrying on their own manufacturing process. No chlorophyll is needed, and since there is no other prominent pigment (there is sometimes enough erythrin to produce pink Indian pipes) the plants are white without being true albinos.

Among animals the chance for survival of albinos is generally better, since the animals are not dependent on pigment for the manufacture of their own food. Both the invertebrate and the vertebrate groups produce albinos more or less regularly. Albinistic insects, crayfish, brook trout, salamanders, snakes, and mammals of many kinds are known. Among man-

kind albinos occur much more frequently than most of us realize. In fact, the word was coined to apply to white *negroes*, these abnormalities usually being objects of superstitious veneration on the part of the African tribes. The legend of the "fair god" among the Indians of Middle America is as likely to have arisen because of the accident of an albino as from the visit of a native from the lost continent of Atlantis. One author states that an albinistic individual occurs among every 10,000 human births.

Large albinistic mammals have had a peculiar fascination for primitive people. One of the first "nature" books (pretty badly faked I am afraid) to which I was exposed was "Boy Hunters," by Captain Mayne Reid. It detailed the adventures of three boys in pursuit of a fabulous white buffalo, an object of worship to the plains Indians. White deer, so it is said, were regarded as spirits by the woods Indians, and were never shot. Of course the subject has been dealt with in high-grade literature, "Moby Dick" having as its central figure a white whale. The veneration of the Siamese for white elephants is common knowledge. At the present time one of the prize exhibits on the Montana National Bison Range is an albino buffalo bull.

Albino birds of many species have been reported, and museums are likely to acquire good numbers of such specimens. Brown pigment (melanin) seems much more likely to disappear in inheritance than the red or yellow. Thus albino sparrows are fairly common, and albino crows, vultures, ravens, and blackbirds of various kinds have been reported. But albinos are much rarer among the brightly colored birds, the red and yellow pigments seldom entirely disappearing, although their intensity may be much decreased. I have seen (in life) a white goldfinch on which I could de-



Snowy egret by Alfred M. Bailey

tect no pigmented feathers, but it was impossible to determine whether or not the eyes were pigmented.

E. A. McIlhenny had the unusual opportunity of observing for some time the offspring of a pair of normally-colored mockingbirds, both of which, however, must have been carrying the albino factor as a recessive. Over a period of years the pair produced 43 normally-colored offspring and 18 albinos, a fair Mendelian ratio as between dominant and recessive. None of the albinos survived. Some years ago J. M. Edson reported in *The Auk* a remarkable incidence of partially white birds in a flock of Brewer's blackbirds. Among 500 individuals he estimated that 40% had some white in their plumage.

Thus we see what may happen when pigment-inducing factors fail to

work. Reversing the procedure, color factors may occur in abnormal numbers or combinations, resulting in an intensification of pigmentation. The commonest of such processes in animals is the intensification (abnormally) of melanin, leading to darker (melanistic) individuals.

Melanism is of regular occurrence in some species of birds and mammals. Black squirrels, silver foxes, and black leopards, all more or less common in some places, are examples of mammalian melanism. A number of hawk species have melanistic phases: the well-known Harlan's hawk, for example, has been regarded until recently at least as a melanistic phase of the red-tailed hawk. It has been possible to develop and perpetuate a

The egret is white and so is this squirrel. How can you tell that the egret is not an albino?

Gray squirrel by W. Bryant Tyrrell

race of ring-necked pheasants of much darker than normal plumage. Unlike albinos, melanistic individuals do not have the physical handicap of poor eyesight and are much more likely to survive and to breed successfully.

Among the songbirds melanistic individuals are, seemingly, quite rare. Earlier mention was made that *The Auk* in 60 years had only one indexed reference to melanism, and this one was the record of a partially melanistic laughing gull, not a songbird.

During the summers of 1932 and 1933 I had the chance to observe a melanistic cardinal (*Richmondia cardinalis*), the only abnormally darkened songbird I have ever seen in nature. This bird, a male, was solid black on head, nape, and upper breast, save that in the crest was one unusually long *pink* feather. Obviously, he was a strikingly handsome individual. He was discovered after the nesting season in the first summer, but he customarily associated with a normal-appearing female.

The next summer this melanistic male was mated to a female that showed abnormally yellow plumage (possibly one of his own offspring), and I had a chance to see what happens when color factors begin to get mixed up. Among three young birds which left the nest, two showed yellowish-white feathers. Apparently the normal color patterns were pretty badly upset. The male disappeared after a time, and other duties prevented my follow-up of the remaining cardinals in the community. It is worth pointing out, however, that other melanistic cardinals have been reported, one a nearly totally black bird observed in Illinois.

A definite relationship between dark outer coverings of animals and high humidity, with resultant lessened exposure to sunlight, has been pretty well established. Since humid





Donald G. DeLisle

Can you explain why, in a single screech-owl brood, there may be both red-brown and gray birds?

conditions are likely to result in dense vegetative cover, the light exposure of forest dwellers is still further decreased. The classic ornithological example is to be found in the North American races of the song sparrow, a study so familiar that it need not be detailed here. Suffice it to say that in areas of constant exposure to light, such as the sandy Atlantic coastal plain, the high plains of the West, and desert fringes, the song sparrow races are light in body color, gray rather than brown. In humid areas the reverse is true; the races are dark brown in general tone, becoming almost black in the dense forested areas of the northwest coastal region. In tropical rain-forests the birds of the dimly-lighted forest floor are likely to have somber plumage—the bright-hued species live up in the sun zone of the treetops. Any amateur student who has the opportunity to study animal

life in two or more diverse regions can make observations of value along this line.

Erythrism, the intensification of red pigment, occurs both in birds and mammals, but is apparently of rare occurrence. A classic example of natural erythrism is discussed by Dr. H. L. Stoddard in "The Bobwhite Quail." He tells of a colony of such birds near Grand Junction, Tennessee. Over a twenty-year period of observation, the birds increased in numbers and extended their range. The owner of the plantation on which the birds first appeared describes them thus: "... Several birds in this bevy looked to be a distinct red when in flight, and sometimes when the sun was shining they appeared to be a brilliant red. . . . The auburn red is much like that of the Scotch grouse. These quail are normal in weight and habits. No birds have been introduced on to the preserve for the past twenty years. The birds in these beves, other than the reds, are just natural, everyday bobwhite quail."

Dr. Stoddard observed and collected some of the red individuals, and he figures a beautiful individual from whose plumage white has almost completely disappeared, the body color being rich red-brown, with some black areas, bars and washings. One might judge that the factors for melanin have also become intensified in these individuals, since the normal white throat patch of the male has been re-

This tiger swallowtail butterfly is normally patterned—yet occasionally you will find one with two yellow and two black wings—do scientists understand why?

Edw'n Way Teale



placed by an area of intense black, with just a few lighter wavy stripes.

Caged birds, presumably subjected to unnatural diets, are most likely to exhibit xanthochroism, the intensification of the yellow pigment. Parrots in captivity often increase the areas of yellow in their plumage, or may actually develop yellow areas which replace another normal color, usually green. Stoddard tells of male bobwhites which, in nature, have a yellow wash over the white of the plumage. That red and yellow occasionally get mixed up in nature is attested by the recent discovery (in North Carolina and West Virginia) of a number of ruby-crowned kinglets in which the normally red feather spot on the heads is yellow or orange.

Certain animals regularly have two separate and distinct color phases. This is *dichromatism*, and is little understood. To ornithologists the most familiar example is that of the common screech owl, where red-brown and gray birds often occur in a single brood. Study has shown that either sex may show either plumage phase, that two similarly colored parents may have any possible combination of the two colors in the offspring. If there is a fixed inheritance pattern it has not been discovered.

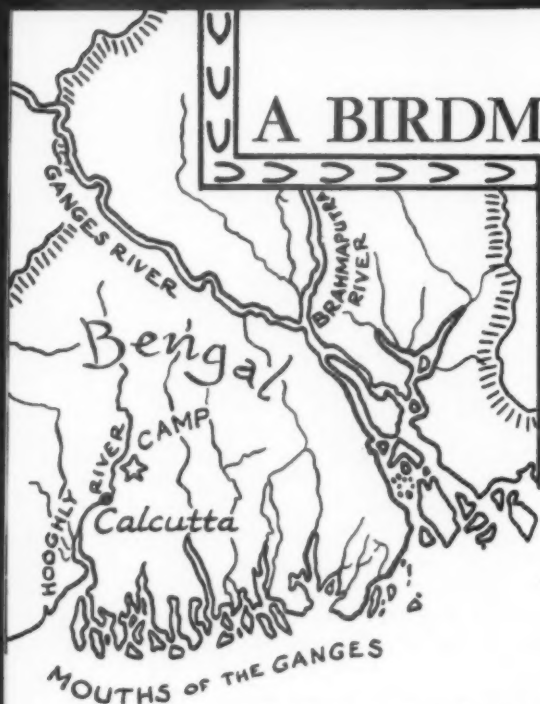
Among other examples of dichromatism in the animal kingdom, a striking one is the common tiger swallowtail butterfly (*Papilio turnus*). In the northern part of this butterfly's range both sexes are yellow, with black markings. In the southern part of the range, however, some females are black. Occasionally there is a striking, aberrant individual with two yellow and two black wings. The timber rattlesnake also has two common color phases (although there are others not so distinct). Yellow is the most common body color, but in the heavily-forested southern Appalachians some individuals, usually males, are black.

Given a few basic pigments, plus the effects of refracted light, nature has achieved blends and tints of kaleidoscopic complexity. But the story of *pattern* in the outer coloration of living things is much too long, and too involved, to tell here, even if we knew more than a tiny fraction of the answers. Every serious nature student should beg, borrow, or acquire in some manner, a copy of G. H. Thayer's fascinating book, "Concealing-Coloration in the Animal Kingdom." Here one is introduced to the marvels of counter-shading, oblitative markings, ruptive pattern, and a hundred other matters that explain or interpret the endless variations in animal coloration. It isn't necessary, perhaps, to follow all the Thayer conclusions to the ultimate, but certainly no other volume in our literature will give the reader a comparable idea of the meaning of color pattern in animals.

Most people are strongly influenced by color, even if they are not always conscious of it. Color has been a prime factor in painting, and the advertising profession has learned to appeal to all of us through subtle and pleasing hues. Womankind, so I have been told, is given to weighing the effects, and anticipating the results, to be expected from costumes of certain shades.

All of us hope that more persons may become interested in birds, and color is the key, I believe, which is most likely to unlock that door. Let people *see* the pattern on the wood duck (*sponsa* in the scientific name means "arrayed as a bride"), or the hues that flame in the plumage of our warblers, and they will become life-long bird enthusiasts. Through color and beauty they will be guided to new and unfolding meanings. Like the young man on the mountain with Elisha, their eyes will be opened to a host which fills the earth as well as the heavens.

A BIRDMAN IN INDIA



BAY OF
BENGAL

By Fred G. Evenden, Jr.
illustrated by Anne Locke

II

AFTER our trip across India, our living took a definite change for the better for we settled in an air force distribution camp for several weeks. We had roped bunks to sleep on; much better food (with ice cream once in a while); and space to move in without bumping three or four other fellows.

Our camp was some little distance from Calcutta. Calcutta, itself, is situated a little inland from the north end of the Bay of Bengal. The country is comparatively flat, as the delta mouths and numerous tributaries of the Ganges and Brahmaputra flow through this area. It is in sharp contrast to the rugged coast of India. Most of the land area is used for rice paddies, pasture, and jute raising.

Except for the first two or three days of "processing," most of our stay at this camp was free time to us. And

believe me, Bob Wagner and I took advantage of it, too. Although both of us would much rather have been home in the United States, this camp was an ideal place to be located, and so it was much easier to forget our homesickness.

The weather was ideal—cold at night and just a little above room temperature in the daytime. Winter in this part of India is hard to beat. And we had three environments in which to study birds—a parklike grove of trees, a jungle, and a lake.

The entire camp area was like a well-kept park, made up of grassland, spacious groves of broadleaf evergreens, and palm trees. No underbrush was present to restrict our "strolls" around the camp. The ground was not level, and there were many depressions where water was stored.

To the south of the camp, right up to the fence boundary, was a truly tropical grove of approximately 150 acres, well-tunneled with footpaths and one wagon road. But the minute we left the road or footpath we found jungle vines even more dense than the Oregon coast ranges, with its underbrush of salal, vine maple, and devil's club. It was usually worth breaking brush, however, to get to some undisturbed glen.

The lake or *jheel* was artificial and about a mile and a half long and 300 yards wide, with marshland along the northwest side. Of the fish in the lake, there were two or three species of *Cottids*, a species of gar that reached eighteen inches in length, and a species of carp that weighed up to seven pounds. Several of the boys fished from rafts and caught them.

By far the most common fish was a little "goldfish," so-called by local

English-speaking Indians. Large-scaled, it is about three and a half inches in length, with a laterally compressed body. The two sexes differ in color, the female being mostly white, with a large black spot on its side, just above the pectoral fins, while the male is an iridescent reddish-purple with black fins. The smaller males constantly jockeyed for position beside the female. The winner took a position below, and about half a length behind the female.

As to water birds, there were only two. The little grebe of which there was just one, and the little cormorant, a pair. Other types of birds were more abundant. There were four different species of wagtails, and the Indian pipit. There was a small plover, the little ring-plover, that looks like the semipalmated plover of the United States. The common snipe is hard to tell in the field from our own Wilson's snipe. It has almost the same body markings, the same erratic flight, and the same alarm note.

Perhaps the most beautiful shore bird was the rather large (12" to 14") red-wattled lapwing. The back and wings are a bronzy-green, with white and black wing bars; the head and chest are black with a reddish eye ring and wattle across the forehead, between the eyes. The bill is pink with a black tip. Down the side of the head is a white strip that connects with the white of the underparts. The legs are yellow. It is really a beauty!

Of course, there were the ever-present little and cattle egrets, paddy-birds and common herons. One noon I saw a cattle egret dash into a clump of bushes and come out with a lizard squirming in its bill. The lizard was about fifteen inches long; nine inches of that was tail! I rushed up, and the egret dropped the lizard, which was pretty well gone. I found that it had a short "mane of spines"



down the nape and onto the back. On the throat was a patch of scales (pastel yellow and pink) that seemed to be longer, and spatulate in form. The general body color was brown and more tawny above. Dozens of pied and common mynahs were always at the edge of the lake.

Right at the water's edge, on the unoccupied side of the lake, was a small patch of trees, that served as a roost for the egrets and kites.

Occasionally a large Pallas' fishing eagle, or a short-toed eagle would make a few "browsing flights" the length of the lake in search of suitable food. Neither species was tolerated by the pariah and Brahminy kites, so their stay was usually short as the kites gave chase almost immediately. These Brahminy kites never ventured far from the immediate vicinity of the lake. They would catch snakes, or frogs, and even small fish, if the fish came close enough to the surface of the water.

I would like to mention the little minivet, a strictly arboreal bird about six inches long. Very colorful, the back and head are a metallic blue-gray; a brownish-black patch covers the face, from the eyes down onto the upper breast. The wings are brownish, with a white bar and a flame-red bar. The underparts are white, but on the male this is strongly suffused by a brilliant flame-red wash over the chest and flanks. There is a deep red rump patch, and the tail edge is tinted with pale orange, too.

The minivets were seen in a clump of six trees, on a small peninsula of land, where they were always to be found. We never saw them anywhere else in the camp area. They were in a small flock, busily searching the twigs for insects, or flitting out to catch them in midair. On occasion, we saw them drop down to the water's edge to drink, and once in awhile take insects on the ground.

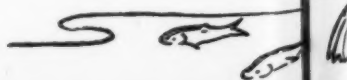
By far the most interesting group of birds in the lake area were the kingfishers: four species ranging in size from six to sixteen inches.

A favorite habit of the small common kingfisher is to hover fifteen or twenty feet above the water, with head and bill horizontal and the body perpendicular. One bird hovered in such a manner for over thirty seconds before it dropped straight down into the water. When flying low over the water, the bird utters a low-trill note. This species might be called pugnacious for it will chase the bigger kingfishers away from the lake which it considers its own territory.

The white-breasted kingfisher is the "freak" of the kingfisher group, its chief food is insects and some of the smaller amphibians. We saw it fly from its perch and catch a small frog on the ground at the edge of the lake. We have seen several individuals catch fairly large beetles in mid-air, which I think is an accomplishment considering their flight structure. The strangest place I ever saw one was in the upper branches of a tall tree in a patch of jungle! It was emitting a loud and persistent, unmusical (and even raucous) scolding note, which lasted for at least four or five minutes.

The third species, the pied kingfisher, is twelve or thirteen inches long. The two sexes are told apart by the black bands across the chest: the male has two, the female one, broken in the center. There was one pair at the *jheel*, and I noticed that the activity of the two birds was confined to a hundred yard strip of lake shore. Along this whole strip there was only one tree for them to perch in. They seemed to have set up their own territory there, and not once did we see another kingfisher intrude.

Once I was standing at the edge of the lake busily watching these pied kingfishers when it dawned on me that I had company. I turned around



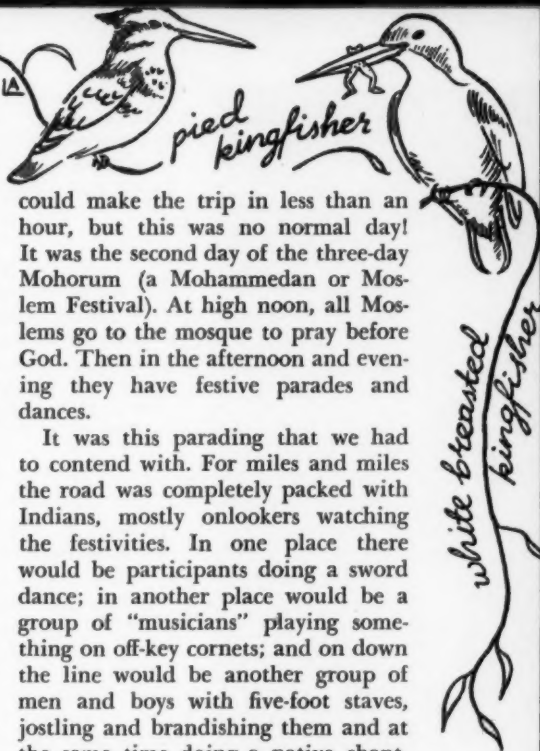
and there were a dozen or so natives who had been working nearby. They wanted to look through my glasses at the "Mawsranga" (Bengali for kingfisher). It was fun to hear some of the exclamations that came from them when they saw things enlarged through the glasses.

It wasn't until the last week at the camp that Bob and I had a "sudden awakening." From time to time we had noticed some "variations" in the color pattern of the white-breasted kingfishers as they flew by, or away from us, but we never thought much about it. However, on one of our last days, on the far side of the lake, we saw a white-breasted and another species of kingfisher, almost half-again larger than the white-breasted. It turned out to be a brown-headed stork-billed kingfisher. It was fully fifteen inches long, and, as the name implies, its outstanding feature was a gigantic red bill, four or five inches long. The similarity between the general color pattern of these two birds really had us fooled for quite some time. I had no opportunity to learn about feeding habits of the stork-billed, but I do know it is a very timid bird, at least so far as we were concerned.

These Indian kingfishers may be beautiful birds, but I would gladly trade them all for the chance, at this very moment, to be fishing in a canyon on the north fork of the Molalla River, Oregon, and hear the "rattle" of our own western belted kingfisher as it flew over me.

Although there were many other birds in the lake area, I believe that this tells you about the more interesting inhabitants.

The day after Christmas, Ernie Rogers (of Atlanta, Georgia), Bob Wagner, and I hitch-hiked on an army truck into Calcutta. Normally we



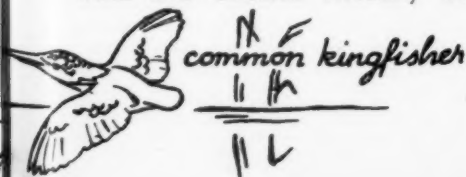
could make the trip in less than an hour, but this was no normal day! It was the second day of the three-day Mohorum (a Mohammedan or Moslem Festival). At high noon, all Moslems go to the mosque to pray before God. Then in the afternoon and evening they have festive parades and dances.

It was this parading that we had to contend with. For miles and miles the road was completely packed with Indians, mostly onlookers watching the festivities. In one place there would be participants doing a sword dance; in another place would be a group of "musicians" playing something on off-key cornets; and on down the line would be another group of men and boys with five-foot staves, jostling and brandishing them and at the same time doing a native chant. Along the entire route were small, colorful parade units. The natives, dressed in the gayest of colors, carried banners, or flags, as high as twenty feet or so; some carried wood and tissue paper replicas of innumerable temples or mosques. Others carried drums or large metal discs, upon which attendants beat vigorously.

As most of the afternoon was taken up in getting to town, eating was about the only thing we had time to do in Calcutta before returning. And believe me, I lived up to my reputation as a "chow-hound" by starting out with a chicken dinner, next a fillet of sole, and I finished with roast pork. By that time all I needed for dessert was a couple of dishes of lime ice cream!

After such a trip as this we were more than glad to return to camp, and the peaceful and quiet pursuit of bird watching.

(To Be Continued)



Wonder
World
of
Bird
Life
compiled
by
Alan
Dewol

A BIRD'S feather, for its size and weight, is the strongest known structure in nature. It is also almost incredibly elaborate in construction. On each side of the feathery fibers attached to the feather's central shaft are two rows of smaller fibers called barbules. On a single feather these delicate barbules may number more than one million.

1 1 1

BECAUSE woodpeckers and hummingbirds use their tongues to extract insects from bark-crannies and the cups of deep flowers, the tongue needs to be extended a long way and with great force. In both these varieties of birds, the roots of the tongue sometimes curl up over the back of the head and are attached under the roof of the skull. In certain instances the tongue curls up in the tip of the bill, and there are even species in which the tongue-roots actually curl around the eye.

1 1 1

BIRDS live their lives with an intensity as extreme as their brilliant color and their vivid songs. Their body temperatures are regularly as high as 105 to 110 degrees, and anyone who has watched a bird at close range must have seen how its whole body is shaken and vibrated by the furious pounding of its pulse. Such an engine must operate at forced draught; and that is exactly what a bird does. A bird's lungs are not the terminus of its air-tubes, as are our human lungs and those of other mammals. The bird's indrawn breath fills not only its lungs, but also passes on through myriads of tiny tubules from the lungs into air sacs that fill every space in the bird's body that is not occupied by its vital organs. Furthermore, the air sacs connect with many of the bird's bones, which are not filled with marrow, as animals' bones are, but are actually hollow. When a bird breathes, it aerates its whole system, so that the bright fire of its intensive life is maintained by a perpetual bellows.

1 1 1

SINCE birds do not have teeth, they must "chew" their food in the grinding part of their stomachs called the gizzard. Amazing feats are performed by gizzards, working in conjunction with birds' powerful gastric juices. Eider ducks, and in fact all sea ducks, swallow whole mollusks and crustaceans, and reduce the shells literally to fine sand. The scientist Spallanzani, in order to find out just what a gizzard can do, once fed a turkey a lead ball studded with small lancets. Eighteen hours later he killed the turkey. The entire armature of the lead ball had been completely destroyed.

1 1 1

WHEN a mother bird is feeding a brood, the youngsters all open their beaks and all raise a clamor each time she comes to the nest with a tidbit. Which baby shall get the food? How to be sure of equitable distribution? To try to feed the nestlings by rotation would be an impossibly difficult memory feat for the busy parent. Nature has solved the matter by giving baby birds a nervous mechanism in their throats which slows down the speed of their swallowing as they become progressively fuller. When a mother bird brings food to the nest she simply pokes it at random into one of the open beaks and then watches criti-

cally to see what happens. If the tidbit doesn't go down immediately, she plucks it forth and pops it into the next beak. The youngster that swallows it promptly is the one with the emptiest stomach. Thus nature insures in a fool-proof way that all the baby birds share and share alike.

✓ ✓ ✓

WHEN a bird roosts at night, with its toes curled firmly around the twig on which it is perching, why doesn't it lose its grip when it falls asleep? The answer is a special bird adaptation that is one of nature's neatest mechanisms. The tendons that cause toe-curling pass around over the back of a bird's ankle joint. The instant the weight of the bird's body bends this joint, as the bird takes its perching position, the tendons pull the toes into a tight curve, clamping the perch firmly and automatically.

✓ ✓ ✓

PARENT birds, in rearing their offspring, must perform almost unbelievable feats of food-fetching. For birds eat at least half their own weight in food daily, and growing fledglings require even more, often consuming more than their own total weight every 24 hours. Dr. Arthur A. Allen of Cornell tells of a mother wren whose feeding trips to her babies were carefully counted between dawn and sunset of one day. She fed the babies 1217 times.

✓ ✓ ✓

FEMALE birds of any given species ordinarily lay about the same number of eggs in a clutch—three to five for a robin, five or six for a phoebe, and so on—but if some of the eggs are removed the bird may lay replacements. The "reserve of fecundity" which she can call upon in such cases is almost unbelievable. A classic instance cited by ornithologists was that of a flicker (golden-winged woodpecker), which was first described in *The Auk* almost 50 years ago. All the eggs, except one, were removed from the flicker's nest, and the theft was repeated daily to see how long she would go on laying replacements. The baffled but determined flicker laid 71 eggs in 73 days.

✓ ✓ ✓

LIKE most wild creatures, birds have many sensory gifts which in human beings are lacking or dulled. Perhaps their most extraordinary is their sense of direction. At the beginning of World War II, experiments were under way in Poland to try to determine whether possibly birds can sense the magnetic lines of force stretching from the north to south poles, and thus direct themselves somewhat like feathered compasses. At any rate, whatever science's final verdict may be, the birds' sense of direction produces startling performances. In one experiment seven swallows were caught near their nests in Bremen, Germany, and marked with tiny identifying daubs of red paint. Then they were boxed, whisked to an airport, and flown by fast plane to Croydon, England, near London. There they were released. Bright and early the next day, five of the seven swallows were contentedly back at their nests in Bremen.

Alder flycatcher by Eliot Porter





Alexander Sprunt, Jr., and
Alexander Sprunt IV,
("Sandy"), father-and-
son ornithological team.



AN EXPERIENCE IN COMPANIONSHIP

By C. Raymond Vinten

*Coordinating Superintendent
Southeastern National Monuments
National Park Service*

THE Carolina Low Country knows Alexander Sprunt, Jr., as the champion of birds; the Northeast knows him as a southern representative of the National Audubon Society whose name is almost synonymous with the wild creatures of the southern wilderness, the whole United States now knows him as an Audubon lecturer and bearer of good tidings from the South's spectacular bird world. Many an individual who has followed him on Audubon Wildlife Tours on Bull's Island and in Florida

knows him as a leader who can always produce any bird you ask for.

But not everyone knows him as a father who has met the severest test of all—that of passing on to his son the ability to enjoy "America, My Country" and its wild landscapes and wild birds. I learned it by chance, and I think it is worth passing on as an inspiration to other parents and to all adults who seek to inspire youth with a love and understanding of the out-of-doors.

The stage is set in Miami, Florida,

D
and the time is June 1945. The morning is calm, balmy and overcast. Two tall, wiry South Carolinians settle themselves in my car and we roll south toward the Florida Keys. As soon as we pass Homestead, and reach the open marsh country, two pair of binoculars come out of their cases and immediately assume a place of adornment which they occupy for the next four days, suspended from two very similar necks. These same necks start craning in unison, first one side of the road then the other. Up go the binoculars in unison, "It's a red-shoulder," in unison; and I have to keep my mind on my driving as I realize that this kind of team work is far more unusual than the mere discovery of a red-shouldered hawk.

On we roll, down long Key Largo, and the senior member of the team and I become deeply involved in a discussion of the job ahead of us, making a count of the Tern Colonies at Fort Jefferson National Monument. All this country we are going through is familiar territory to the senior member. It is all strange and new to the junior member, who had not been in the Keys since he was a small boy.

I paid little attention to the young man back there on the rear seat, until I heard, "Dad—a white crowned pigeon." The senior member whirled around, and as the bird disappeared in the green jungle beyond he said approvingly, "You're right Sandy, you're right. Did you notice the strong beat of the wings and the way it held that white-crowned head up high as he sailed into the woods? That's a sure sign. That's the first one you've ever seen, isn't it Sandy?"

Said I, "How did that boy know a white-crowned pigeon if he'd never seen one before?"

The senior member of the team, Alexander Sprunt, Jr., didn't answer my question directly, but I began to understand the reason when Alex ex-

plained to Sandy, otherwise known as Alexander Sprunt, 4th, that Key Largo was the northern limit of the range of this beautiful and rare tropical bird, that it came to the Keys each spring to nest and then returned to the deep tropics, and that its numbers had been depleted by "squab hunters" until its existence was threatened on the Keys; as well as many other facts about the species.

We counted 29 pigeons along the highway on that trip. That was a record for me, as seven was all I had ever seen from a car on one trip. But let it be said here and now that the experience was of very minor interest in comparison to the satisfaction of watching this father and son combination. I can hope to count 29 pigeons on some other trip, but I can never hope to see another "chip off the old block" where grain, fiber and cell are so nearly identical as this particular chip off this particular block. The same name, the same build, the same alert interest in the world of nature, and the same rivalry to know more about this world, are only a few of the striking similarities between these two.

The trip down the Keys ended at Key West that evening. Early the next morning the Coast Guard patrol boat #83405, churned past the North Channel markers and headed westward for the Dry Tortugas. Alex was talking photography with one of the crew. Sandy and I were on the fantail talking about the things we would see at the end of the sixty-five mile trip. We watched skip-jacks scurry away from the roll of the bow wave and the mischievous porpoises race alongside and grin at us as they rose to blow little clouds of spray. Then those binoculars flew up again and Sandy yelled, "Dad!" Alex reacted automatically as Sandy called out "Wilson's petrel."

"That's right," said Alex. "See that

white patch at the base of the tail?"

That was Sandy's first Wilson's petrel. I still wondered how he knew these things. To me, here was a little fluttery marine bird of some kind that I'd seen many times before, but otherwise it was a stranger. Here was a kid from way up in Charleston calling these things by their first names.

Shortly after noon we found ourselves at the same "rocky islets" that Ponce de Leon visited in 1513. As we turned into the channel we began to see the cloudy, whirling haze over Bush Key that later came into focus as thousands of noddy, sooty and roseate terns. I was down below getting my baggage arranged so as to lose no time in getting ashore as soon as the lines were fast to the Fort Jefferson pier. I wanted to be ready to receive a royal welcome from our Custodian Russell Gibbs, his wife Juanita, and their year-old son who is known in naval circles as "Salty." Everything ready, I came up on deck. There was Alex Sprunt, Jr., with Alex Sprunt, 4th,—no thought of baggage or no thought of welcoming people, just two pair of eyes glued to two pair of binoculars, two people with one consuming interest. I stepped up quietly and said in an offhand sort of way, "That's quite a mess of birds there, isn't it?" They both turned in unison and just grinned, Alex with that mature, ap-

preciative grin; Sandy with that excited, thrilling grin. Then both returned quickly to the binoculars.

The next two days at Fort Jefferson were busy ones. Russell Gibbs and I had much to do, inspections, programs, plans, finances, protection, and the usual visit to Loggerhead Key to call on our neighbors at the Light Station. Alex proceeded with his count of the terns, taking pictures, checking nesting concentrations, studying predators and casualties, which luckily were few. "Sandy" was with him every minute, a veritable "me and my shadow," more than ever a "chip off the old block." We had to travel our own paths during those two days so as to finish what we set out to do in the limited time available. Consequently, I heard little of the conversations that took place between father and son. Now and then we would catch a glimpse of them through a gun embrasure or from the terreplein of the old fort. There they were, over on Bush Key, heads together, discussing goodness knows what, but whatever it was you can be certain that Sandy was learning things that he wanted to know, and Alex was taking time to tell him.

Our evening discussions, out there on the islands, were most intriguing. Sandy's collection of shells, bits of coral and sea fans, had to be identified





Photograph of noddie tern (left) by Hugo H. Schroder. Photographs of sooty tern (above) and of terns on Bush Key (below) by Robert R. Budlong of the National Park Service.

and packed. Alex talked about the distinguished markings of the young and adult man-o-war birds, and the feed-

ing habits of these great sea-farers. He discussed the methods he and Sandy had adopted for estimating the noddie, sooty and roseate tern populations, finally arriving at 109,000 sooties; 500 to 750 noddies; 160 to 180 roseates. After we had agreed that the figures were reasonably accurate, Alex uncoiled his long angular frame and we heard him tell of his native Charleston. A few "Geechee" stories took us right out of the Dry Tortugas and we were momentarily at Beaufort and Edisto.

The third day we returned to Key West and the fourth day found us back at our hotel in Miami. That ride, back up the new Overseas Highway, was the same coming as it was going. Great white herons, white-crowned pigeons, boat-tailed grackles, pelicans and cormorants were all friends of ours. They were not just strange, pretty birds. They were a vital part of the world we live in, an intimate part of the scenery which lived and moved. This was what I had always thought of as education, an ideal kind of training that brought the indoor classroom out into the open where the background of sky, sea and forest gave reality to the excitement of seeing and learning. And amid this passing scene, here was the inspired teacher and the anxious and alert pupil enjoying the fullness of life that goes with a knowledge of the world of nature.

Our parting in Miami left me with a feeling of one who had seen things in his own backyard that he never knew existed before. They were the same familiar things, but they had taken on new life and meaning. This young Sandy, this "chip off the old block," had given them a new interest. Now, a white-crowned pigeon brings to mind those experiences of the Florida Keys and the Islands of Tortugas,—a wise father and an eager son enjoying the best things that life affords.



Birds have

ZIPPERS

by
James R. Snyder

Illustrated by SuZan Noguchi Swain

CRAWLING stealthily through the high dry grasses which lined the banks of a pond on a coastal island off the Carolinas, I came at last to the water's edge. There twenty feet away were five buffle-head ducks, diving for the tender shoots on the pond bottom. At intervals for three days I had been watching these beautiful swimmers through my field glasses and now I could almost touch them! Presently out of the corner of my eye, I observed a little pied-billed grebe floating toward me, blown by a gentle breeze. Oblivious of my presence he was leisurely preening his feathers, which had been ruffled, perhaps by pushing through the ragged weeds along the shore or perhaps by splashing vigorously over the surface of the water.

When the grebe floated within arm's length, I observed an interesting thing. Whereas he had thus far been simply rearranging the different feathers, he now began work on a single feather, the surface of which had been torn in many places. Grasping the feather near the base with his bill, he drew his mandibles along its entire length several times. Then he returned the feather to its place in the primary row of wing pinions, smooth-

ing it with the side of his bill. I could plainly see that this ironing operation had removed every tear from its surface and it was now intact, like a piece of finely spun cloth.

I raised myself slightly to get a better view of this fascinating bit of mending, when *whrrrr!* the wary buffle-heads saw me and sped away. The grebe dived instantly.

On my way to the cabin I pondered this little miracle of reconstruction. As I reached the edge of the marsh I spied a mass of feathers several feet from the path. It turned out to be



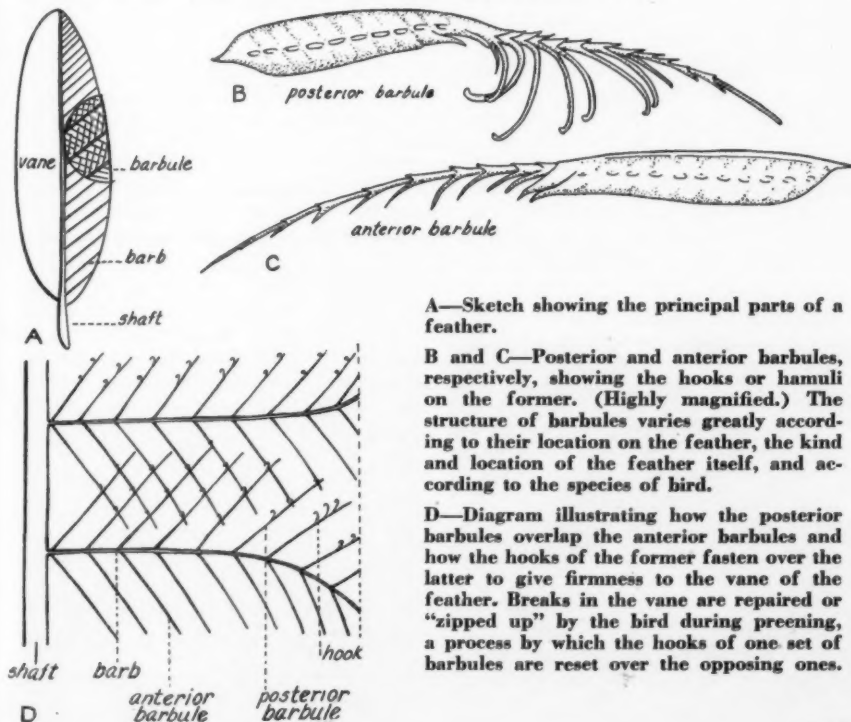
the remains of a green-winged teal which undoubtedly had been struck down by the duck hawk which for several days I had seen sailing over the wide pond. Pulling out a wing feather, I examined it with my pocket magnifying glass. Under the powerful lens the regular veining stood out like the strong texture of heavy gabardine cloth. Then I ruffled the feather by piercing its webbing in a number of places with my fingernail.

Looking through my glass at the very edge of these torn places, I saw a row of minute hooks. On the opposite side of the tear was another series of little hooks. Eagerly I stuck the glass into my coat pocket and holding the feather by the root, drew it gently between my thumb and forefinger. After two such manipulations, the fabric on each side of the central shaft was knit together again. These thousands of little hooks (they are called *barbicels* and *hamuli*, I later

learned) had grappled one another and had so enabled me to zip up the feather!

Thus in another of her many miracles of ingenuity Mother Nature has given to birds a clever means of sewing up their garments. If the little grebe's feathers had been made of an easily torn and non-mendable substance, then one unfortunate brush against a thorn bush or one frantic escape from the sharp teeth of a snapper turtle would shatter many of his feathers and perhaps ground him permanently. His wings, like those of a pursuit plane shot up by devastating flak, would leak too much air. Never again could he speed across the sky to his distant nesting grounds, driven by strong pinions.

But birds have zippers, you see, and can repair the damage done to their feathers. The next time you pick up a stray wing or tail feather, try these zippers yourself.



A—Sketch showing the principal parts of a feather.

B and C—Posterior and anterior barbules, respectively, showing the hooks or hamuli on the former. (Highly magnified.) The structure of barbules varies greatly according to their location on the feather itself, and according to the species of bird.

D—Diagram illustrating how the posterior barbules overlap the anterior barbules and how the hooks of the former fasten over the latter to give firmness to the vane of the feather. Breaks in the vane are repaired or "zipped up" by the bird during preening, a process by which the hooks of one set of barbules are reset over the opposing ones.

—ENROLL NOW FOR ONE OF FIVE

Nature Courses

at the

Audubon Nature Center

GREENWICH, CONN.



Yellow warbler on a double-decker nest with a cowbird's egg buried in the bottom tier. By Hal H. Harrison

June 10—June 22

Bird Life and Bird Conservation. Field observations at the height of the breeding season, bird photography and colored bird movies.

June 24—July 6

Nature Counselors' Course. Prepare for summer employment. Learn to know birds, trees, flowers, insects, mammals, rocks, and invertebrates in the field.

July 8—July 20

Elementary Ecology. See how plants and animals live together, and how dynamic nature study can be when all phases of the living environment are considered as a whole.

July 29—Aug. 17

Conservation Workshop. Plan a practical and useful program of conservation for your school, club or community. Field trips and conferences with state and national experts will give you a new insight into the problems of conservation.

Aug. 19—Aug. 31

Advanced Ecology and Wildlife Management. Increase your background and experience with plants and animals, with wildlife habitats, soil and water relationships, and wildlife management practices, through intensive field studies.

Spring peeper calling by Edward A. Hill



Please send me further information about the courses at the AUDUBON NATURE CENTER at GREENWICH, CONN., for 1946. I am particularly interested in the following sessions:

<input type="checkbox"/> Bird Life and Bird Conservation	2 weeks	\$65
<input type="checkbox"/> Nature Counselors' Course	2 weeks	65
<input type="checkbox"/> Elementary Ecology	2 weeks	65
<input type="checkbox"/> Conservation Workshop	3 weeks	95
<input type="checkbox"/> Advanced Ecology and Wildlife Management	2 weeks	65

Write to

**NATIONAL AUDUBON SOCIETY
1000 FIFTH AVE., N. Y. 28, N. Y.**

Conservation Workshop

In which you gather information and learn the techniques and methods of putting conservation ideas to work in your community.

TO acquire knowledge of the living environment while exploring the out-of-doors has an irresistible appeal for most of us because it embraces such pleasures as watching birds, as following the trails beneath the leaf-green canopy of a woodland, as wading in the water along the shore to observe marine life. That we can learn while we enjoy simply proves that nature is a delightful teacher.

To catch a fleeting glimpse of a deer or a pileated woodpecker is no less thrilling because the purpose of your field trip is to study how a forest protects your city's water supply; the trees are no less beautiful because you consider their function of retarding run-off and storing moisture to feed the reservoir; the marine life along the shore is no less interesting because you learn what must be done to protect the waters from pollution.

A Conservation Workshop, like other outdoor nature courses, takes you into the field where you can observe the relationships of the wildlife community, but it also stresses the methods and techniques by which you

can put the principles of conservation to work in your own community.

Few of us are interested in hoarding information for its own sake, as a miser hoards gold. We want to *share* our knowledge of the natural environment—we want to help others understand that the health, happiness and prosperity of the community, region and nation depends upon our intelligent use of the land and its resources.

How do we do it? Where do we begin?

In the Conservation Workshop you select a "project" of your own so that you will have a particular problem to tackle—so that you will have something specific around which to build up information. It may be roadside improvement or where to relocate a highway; it may be how to provide more parks and recreational centers for your town, or how to get local support for the inclusion of wildlife sanctuaries and nature trails in the park system; it may be a zoning problem for residence and business districts; or a movement toward landscaping school and factory grounds; perhaps a stream needs protection from industrial waste, or your city's water supply system may be threatened by lack of proper watershed forests. Every community in the United States has a multitude of land-use problems—all in crying need of intelligent attack from its citizens.

You may be a teacher or a member of a parent-teacher organization, a member of the Garden or Civic Club, a member of the Town Board or

Photograph by Gottscho-Schleisner



Council, a librarian, a Scout leader or one of the workers with the Y.M.C.A. or the Y.W.C.A.—all come together in the Workshop and exchange ideas on how to make a community a better place in which to live. The teacher's particular project may be one of bringing conservation information to the level of the age group which she teaches—but she wants to do this in terms of the community in which her children live. The Garden Club member or the Y.M.C.A. worker may be involved in a zoning problem, but their work is no less with adults than with school children who must be taught what zoning is and upon what principles of land use it rests if the future of the town is to be made secure.

To concentrate on everyday problems in a practical way is the keynote of the Workshop method. You visit the forest, the farm, the streamside, the shore, to see at first hand what is happening. If the forest is being harvested for timber, what kind of cutting is practiced? If trees are being planted, are they planted in mixed species or in dense stands of a single species? What are the advantages and disadvantages as to susceptibility to diseases and attack by insects? As to wildlife? Is the watershed forest doing its job of protecting the reservoir from silting or from drying up in seasons of scarce rainfall? Can more recreational uses be made of this watershed forest?

Is the stream clear and does it support all the life of which it is capable? Are its banks protected by vegetation, or is livestock from the surrounding farms trampling down the banks thus causing erosion and silting up the waters? Is an industrial use being made of the streams, with consequent pollution from wastes? Does this affect not only your own community but an oyster bed at the mouth of the stream where it mixes with the salt water?

How is the shore of a great river being used? Is it beautiful, landscaped for recreation of the people?

You make field trips to see *how land and its resources are being used*, and you discuss the problems that such land use creates with men who are involved in the everyday solution of these problems—for members of the state and town planning board, the highway commission, the public health service, the park commission, the board of engineers are invited to the Workshop to participate in discussion. So, also, are representatives from the Soil Conservation Service, the Forest Service, the Fish and Wildlife Service and other agencies.

This year, for the first time, a Conservation Workshop will be offered as one of the summer sessions at the Audubon Nature Center, in Greenwich, Connecticut. Dr. Richard Lee Weaver, the educational director, and a distinguished staff of instructors bring a wealth of experience to this kind of teaching. As director of the Conservation Workshop in New Hampshire, Dr. Weaver made an enviable record, and those who enroll this summer will be able to profit by his thorough experience in this field. The Workshop will be one of five summer sessions to be given at the Audubon Nature Center during the period June 10 through August 31. All sessions will be of two-weeks' duration except that of the Workshop, which will cover a three-week period, from July 29 through August 17.

To sum it all up, this is a Workshop and, as the very name indicates, it is a place designed to produce something. In our Conservation Workshop, the product that you will make and take home with you will be a well-developed plan or program for some particular conservation activity. In other words, you will receive not only inspiration and ideas, but a concrete plan of action.



London Birding

By **Allan D. Cruickshank**

with photographs by the author

PART II

MUCH of my birding in wartime London was a solitary pastime, but now and then I had the additional pleasure and advantage of companionship with local bird men, who told me of things I might not have discovered for myself. There was Mr. Kinnear, Curator of Ornithology at the South Kensington Museum of Natural History, for whose kindness I shall always be grateful. Through him I was able to discover choice areas to explore around Greater London, and later, on a field trip with him, I heard my first skylark sing.

"Hail to thee, blithe spirit" is an understatement of the bubbling gaiety

of that long, varied song, delivered so enthusiastically. What a pleasure it was to lie in a field of heather and watch the skylark's amazing performances! It leaves the ground on vibrant, fluttering wings, and singing ecstatically, ascends up and up till you are sure it must stop; yet still it continues to rise until it is nothing but a vibrant dot all but lost in the blue sky. At the peak of its ascent the bird faces the wind and just hangs there bubbling with rapturous song. Then with widely spread, motionless wings it drifts towards the earth as lightly as though suspended from an invisible parachute. When about forty feet

above the ground, it closes its wings and dives with speed to the earth.

Another of the gracious London ornithologists who asked me to join him for some birding was a Mr. MacDonald. His costume, a bright Scotch outfit, kilts and all, won my wholehearted approval; in fact, I should like to duplicate it for myself. During my first hour with Mr. MacDonald, strolling through the Royal Botanical Park at Kew Gardens, I saw my first European warbler, the chiffchaff. It reminds me of our Tennessee warbler.

At the annual dinner meeting of the British Ornithologists' Club I met a number of interesting bird people, including Dr. Tucker of Oxford. You can imagine my delight, also, when I saw Alexander Wetmore, Ludlow Griscom and the late Dr. Pearson on the screen—for motion pictures taken at the International Convention held in 1932 were part of the evening's entertainment.

When local ornithologists were not present to tell me about the birds I encountered, I had to rely on books for identification and other information; and indeed, books were a necessary supplement, anyhow. Those which I found most useful were the following:

"Birds of the Green Belt and the Country Around London," by Lockley (*H. F. and J. Witherby*); "Birds of the Wayside and Woodland," by Coward (*Frederick Warne and Co.*); "Handbook of British Birds," by Witherby, Jourdain, Ticehurst and Tucker (*5 volumes, Witherby*); "The Birds of the British Isles and Their Eggs," by Coward (*Warne*).

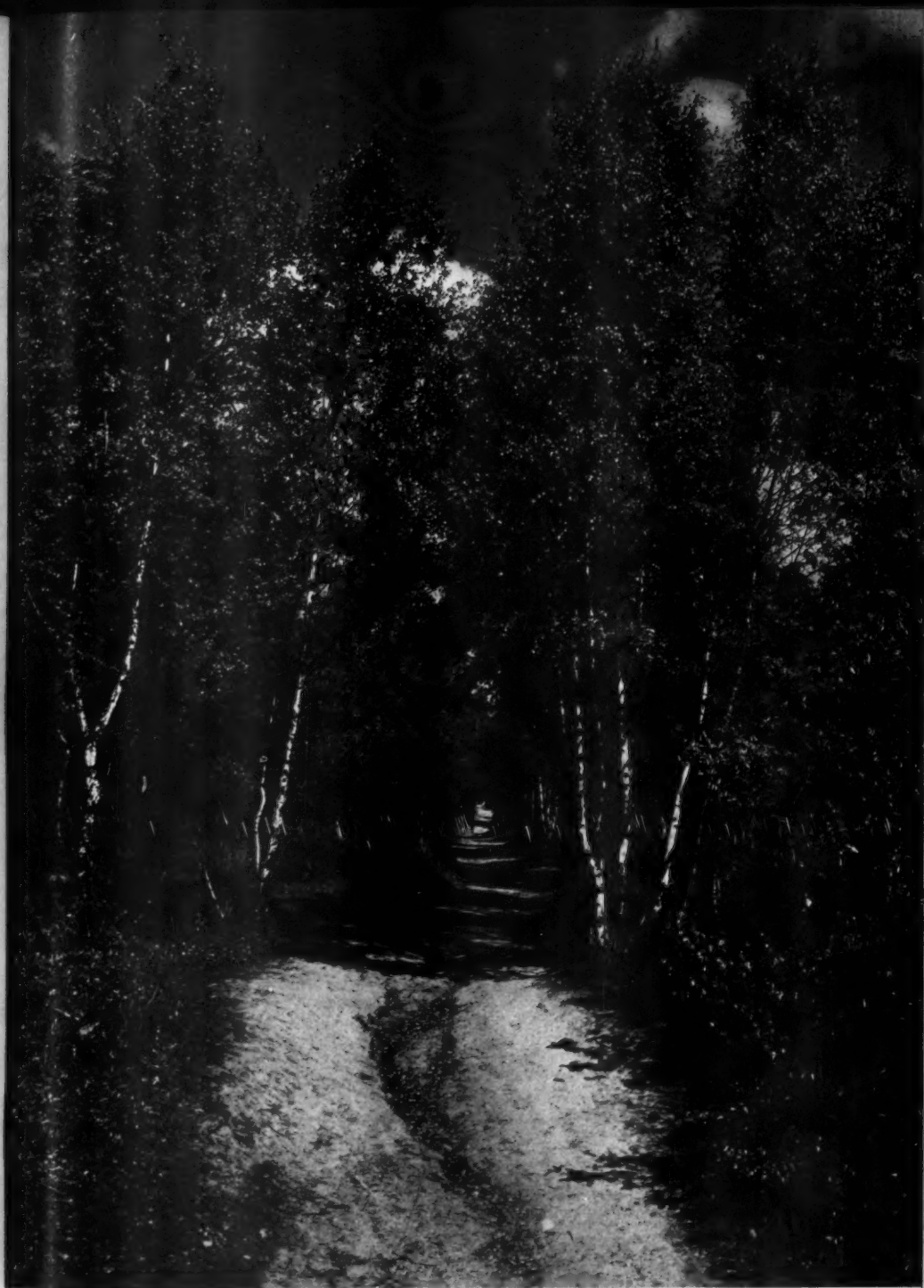
In the Ruislip Reservoir section, just outside London, I saw my first European cuckoo. In late April a great wave arrived from the south, and all at once their striking far-carrying song was everywhere in evidence. They do not sound anything like our American species but rather

like a giant cuckoo clock. I spotted a beautiful courting pair through my binoculars and was able to show them to a chance acquaintance who said that although he had heard hundreds, he had never seen the birds before.

Among the owls, the tawny became a favorite of mine. It's rather like our barred owl but washed with rich brown instead of dull gray. When I first reached London, I heard one each morning as I crossed Green Park to go from my billet to the mess hall. This bird invariably hooted whenever anti-aircraft guns fired at enemy raiders. Later I found the species fairly well distributed in the wilder sections of my favorite haunts in the country. Usually I located tawny owls by the vociferous scolding of birds that had discovered the owl before I did. In such a manner I found one sitting on a shady branch of a giant sycamore. It stared down at me with great, dark eyes. I was mean enough to flush it for I wanted to study its flight. I say *mean* for as soon as the owl glided off on silent wings it was persecuted by two screaming British jays.

Another owl baffled me. Looking out on some pasture land, I thought I saw a burrowing owl flying low over the ground. It alighted and excitedly bobbed its head. As soon as it landed I could see that it wasn't a burrowing owl, but what was it? That night, I referred to the bird books and found that it was the little owl. Late in the last century, the little owl was introduced from the Continent in considerable numbers and has bred in England ever since. Like our burrowing owl in size and color, it too is diurnal and has the same bounding flight, perky mannerisms and head-bobbing habits. Unlike our owl, however, it

A beautiful woodland trail in Ruislip, one of Allan Cruickshank's favorite haunts.





frequently leaves the ground and low fence posts to perch high on some branch.

When I acquired a very legal-looking permit stating that I was entitled to wander over several hundred acres of the Slough Sewage Farm in pursuit of bird study, you can imagine what the boys in my battalion had to say! Nevertheless, the birds flock to this area where the chemically treated and filtered garbage is drained off into the great, controlled marshes—and where birds go, there go I.

In mid-July, hundreds of lapwings fly back and forth between mud flats and plowed fields, an occasional snipe

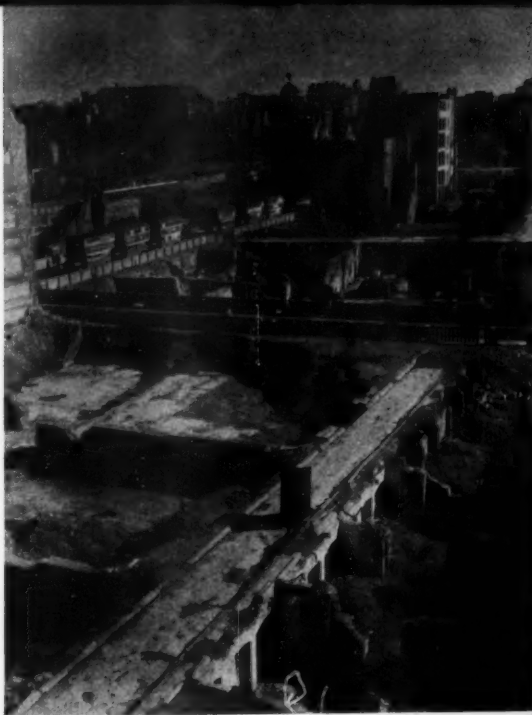
and dunlin may be flushed, and the ponds attract flocks of black-headed gulls, mallards, coots and moorhens. The latter breed there in numbers, for I saw no less than six broods of tiny fluffy black young scurrying into the cattails and grasses for concealment. I was amazed to see several moorhens climb to the top of the reeds to check my whereabouts in the marsh. I cannot recall ever having seen our Florida gallinules do this although the closely related purple gallinules habitually climb reeds and even small trees.

The Slough Sewage Farm gave me a wonderful opportunity to see over and over again great numbers of reed

warblers, sedge warblers and reed buntings. The place was fairly alive with both pied and yellow wagtails as well as swallows and swifts, the latter never failing to surprise me with their forked tails.

Bordering the Sewage Farm area are extensive fields of wheat which attract flocks of wood pigeons, and stock, turtle and rock doves. There were quite a few common partridges, and I added the red-legged partridge to my list of birds seen in this area. I also saw my first migratory quail at the Sewage Farm. Unlike our North American quail, which are permanent residents wherever they occur, this tiny quail (about the size of a starling) is actually migratory. These birds arrive in the British Isles during May and depart for Africa in October.

The most thrilling experience on my first day at the Sewage Farm was to hold seven tiny, hour-old partridges in my hands. I was walking along a trail when a partridge got up with a whirl from right under my feet. At the same time, a second bird began going through a very elaborate injury-feigning act—and then I saw the cause of all the excitement; seven very tiny, fluffy, brown partridge chicks nestled



Left: mute swans at their nest, Ruislip reservoir.

Above: where the black redstarts nest in the ruins of blitzed London.

Below: tufted ducks and a view of Queen Mary's Garden, one of London's many parks in which to go birding.



in a group beside the path.

I have merely brushed the surface of my birding in London parks and the rural areas around Greater London. From time to time, interesting birds showed up in odd places. Directly over the path leading to our mess hall, a pair of wood pigeons in mid-April built a nest on a slender but bushy branch. I pointed out the nest to many of the fellows and soon most of them knew the difference between a wood pigeon and a rock dove!

A pair of mallards swam around in the flooded foundations of a blitzed building, perfectly at ease in the midst of the surrounding apartment houses, and later I found their nest under a ruined wall. Throughout the winter months, black-headed gulls frequently made use of just such bodies of water for resting places.

But although these were interesting instances of the ecological effects of the blitz, I was to encounter a still more curious example in the case of the black redstart. Whereas the common redstart, an attractive black, red, and chestnut bird, is locally abundant as a summer resident in England, the black redstart is generally known there only as a transient or winter visitant, arriving from the Continent in October and departing by the end of April. It is true that a few pairs have been found nesting along the coastal cliffs, but these cases are relatively few.

One day a man whom I met while birding told me that in the spring following the first terrific blitz a few black redstarts, instead of returning to their Continental breeding grounds, had remained to nest in the cracked walls and foundations of the blitzed area adjacent to St. Paul's Cathedral. Later, during a conversation with another ornithologist, I heard the same story. So one morning I set out to investigate, and in less than half an hour of wandering amongst the acres

of blitzed foundations, walls, chimneys and debris, I saw three pairs of black redstarts. The species is attractive, quite similar to the common redstart in size, shape and actions, but with an even more cocky jerk to the head, a more frequent flip to its wings, and a more emphatic vibration of its red tail. The male is more uniformly sooty in color than the common redstart and lacks the chestnut flanks and the white on the forehead. Unlike the American redstart, the Old World species of that name is not a wood warbler. Singularly, it is not even an Old World warbler but one of the *Turdidae*.

Returning to the same area in October, I saw over a dozen of the black redstarts and had excellent studies of those interesting, energetic birds as they flitted before me from foundation to foundation or perched on some dilapidated wall to give forth their queer notes. They have apparently accepted the brick ruins as a good substitute for their accustomed habitat of cliffs and rocky ravines and have established themselves in London as permanent residents. But what makes their presence there so amazing is the fact that the area they have chosen is in the midst of the city noise and confusion, with English sparrows, starlings, and domestic pigeons as the only other breeding birds. Thus, you can appreciate the extraordinary good luck I had to add to my British list a bird that breeds only sparsely in England and then ordinarily on the steep, wild cliffs of the coast.

Such strokes of fortune as that do not occur very often, yet birding in a wholly new environment is almost certain to yield much of interest. Fortunate indeed is the bird enthusiast, for he can take his hobby with him wherever he goes and through it find greater enjoyment in his surroundings and pleasant comradeship with others of like mind.

(The End)

THE PRESIDENT'S

Report to You



MEN of good will are not afraid of the future, for they know it can be molded by the courage, foresight and intelligent action of today. Citizens of this country are well aware of the extra share of responsibility in the world's future that is ours, now that the United Nations Organization is to be permanently located in our midst.

A special committee of the UNO announced early in February that it would recommend to its parent body as a permanent site for headquarters an area on the Connecticut-New York boundary in Greenwich and Westchester. This location includes the property of the Audubon Nature Center, but your Society has not protested or signed any petition and will await developments. Protests were immediately made by many property owners, especially those who have had long established homes there. Doubtless much water will flow over the dam before the matter is settled and it seems reasonable to expect that, whatever site be finally determined upon, property owners will be given opportunity to confer with a planning committee.

We are assuring those who may be thinking of enrolling as students in the summer courses at the Center this year that we have no reason to anticipate the need of any change in plans. We are adding that it might interest them to come and see the area which the special committee of the UNO thinks the most attractive in America

and which may one day play a role in world peace and world conservation.

PARKER RIVER REFUGE CONTROVERSY

Perspective usually helps in thinking through a confusing situation, so let's take a quick look all the way back to 1929, the year when Congress passed the Migratory Bird Conservation Act to provide a nationwide system of refuges. The Act contemplated that each state pass enabling legislation giving consent by law for federal land acquisitions; in 1931 Massachusetts adopted an enabling act "granting the consent of the Commonwealth of Massachusetts to the acquisition of migratory game refuges by the federal government."

In the case of the Parker River National Wildlife Refuge lands, the Fish and Wildlife Service of the Department of Interior began negotiations with landowners in 1940. In 1941 the enabling act was amended to require the "prior approval" of the State Commissioner of Conservation. The establishment of this particular refuge was approved by state officials during the administration of Governor Saltonstall.

The acquisition proceedings were long drawn out; the problem was rendered unusually difficult by the fact that there were many small ownerships in the tract and that there was considerable doubt as to the validity of title of a good many parcels. There seems little doubt that some representatives of the Fish and Wildlife Service were undiplomatic in some of their approaches to property owners whose lands were involved. Ultimately the transaction took the form of a legal "declaration of taking," in which the outside boundaries of the refuge area were specified; this procedure is equivalent to that of condemnation.

Pent-up anger and resentment of many

persons in Essex County, Massachusetts, then boiled over, and a multitude of objections to the maintenance of a refuge in the area sprang up like mushrooms. The state enabling act was repealed. A bill, H.R. 4362, was introduced in Congress, to abolish the refuge; this is strongly supported by the existing state administration, even the Governor having made a special trip to Washington to testify in its behalf at a meeting of the House Agricultural Committee. The identical Senate bill, S.1496, was introduced by Massachusetts Senators Saltonstall and Walsh. At this writing the House bill has been favorably reported by the Agricultural Committee, but has not yet been voted on by the House, and the Senate bill has not yet been acted on by committee.

It is to be deeply regretted that, as is so often the case in controversies, emotions and personal recriminations have tended to obscure the fundamental issue. Your directors, by unanimous vote, committed the Society to support of establishment and maintenance of this refuge. Your Society is far from alone in this view, which is likewise held by such other organizations as the Massachusetts Conservation Council and the Massachusetts Audubon Society. Your president, in personal interviews, conveyed the Society's views to members of the House Agricultural Committee and of the Massachusetts delegation in Congress.

A letter was mailed to all other members of the House, urging them to vote against H.R. 4362 if and when it comes to a vote in that assemblage. It was set forth therein that our familiarity with the area enables us to state that it is the best and most natural location in New England for a wildlife refuge; that, in our opinion, the only apparent sound long-time use of the area, in the public interest, is as a wildlife refuge; that we are not impressed with the arguments of those favoring abolition as, in our opinion, they do not hold water and were conceived and presented after land-owners became incensed at tactics of representatives of the Department of the Interior; that the said Department has

evidenced willingness to cooperate with local interests and has, in our opinion, learned its lesson as regards its tactics.

FEATHER BUSINESS

You will remember that when the National Audubon Society and the Feather Industries of America, Inc., entered into a joint declaration of policy and program early in 1941, its substance was translated into new New York State law. Essential features included absolute ban on any further importations of wild-bird plumage into New York State, the public burning of all then held stocks of aigrettes and plumage of herons, eagles and birds of paradise; provision was also made for the filing with the State Conservation Department of inventories of other wild-bird plumage then on hand unsold, together with written waivers of any constitutional rights that the owners of these inventories might feel they possessed with regard to future possession for sale, offering for sale, or sale of all or any part of said inventories; also, provision that during a six-year period—ending April 15, 1947—it would be legal to possess, offer for sale, or sell items included in those filed inventories.

Recently the feather industry presented a plea that the Society not oppose amending legislation that would extend the time limit for final wind-up beyond April 15, 1947; this on the grounds that war conditions within the six-year period had made it difficult to proceed with liquidation of inventories as had been anticipated.

Your directors took the position that the Society would not agree not to oppose such amendatory legislation. Bills were later introduced in Albany at the request of the feather industry providing for a six-year extension from April 15, 1947 to April 15, 1953. This came at a time when the State Legislature was in process of passing a good many bills extending war-emergency powers of one kind or another. The Commissioner of Conservation and the Chairmen of the Conservation Committees of the State Senate and Assembly counseled a compromise, and your Society then agreed to



Spoonbills and herons over the Texas Coast. Photograph by Eleanor Pettingill.

withdraw its opposition with the understanding that the amendatory legislation would provide for not more than three years' extension to April 15, 1950, and would not change the 1941 law in any other respect. The issue was not of a conservation nature, but of business character involving judgment as to how to obtain the most satisfactory end results.

Leaders of the feather industry went on public record at the conservation hearings on February 27th in Albany as standing four-square with the Society in advocating complete termination of the possession for sale, offering for sale, or sale of wild-bird plumage and of their continued full support of the policies set forth in the joint declaration of program and policy of 1941. Their sole request for revision concerned opportunity to further liquidate inventories in hand for a few years because of dif-

ficulties occasioned by recent war conditions.

FLYING OVER ROOKERIES

Your president has flown during the past month over all of southern Florida below Boca Grande on the west coast and Kissimmee in the center; this both through the cooperation of the U. S. Coast Guard at Miami and with the aid of Flying-Warden Kohler of the Caloosahatchee Seaplane Service at Fort Myers. It is now apparent that at this time there are no large rookeries in that area other than those already known to us through ground observations.

Warden Barnie Parker has in his patrol area at this time four large rookeries and, of course, cannot possibly be at all four places simultaneously. This, however, is where flying-warden service becomes in-

valuable, as all four of those magnificent rookeries can be visited by plane within approximately 30 minutes and a plane equipped with pontoons can land at a short distance from almost any given point in south Florida. Thorough protection of each rookery will, however, continue to depend on placing wardens in boats or on the ground at each rookery location on 24-hour a day service. This objective we have yet to attain, and the Fish and Wildlife Service, which now has definite responsibilities in the area, has not yet reached the point where it has personnel or equipment available to do the job.

On the first flight over the head of Shark River two commercial fishing boats were observed tied up close to the great white

ibis rookery at the headwaters, and the adjoining sawgrass prairie was on fire. Forty-eight hours later the birds were fortunately still there, and an Audubon warden was encamped in a tent with skiff and outboard motor at a point where he could stop and interview personnel on any boat coming upstream from any of several directions. The equipment was provided by the Fish and Wildlife Service, which hopes to provide additional warden service before long.

The East River rookery is larger than it has been in many years, if ever, and contains all of the kinds of ibis, egrets, herons and anhingas that would customarily be found in such a nesting congregation of birds in south Florida. It is a marvelous sight. There is going to be a policy problem as to how we can contrive to allow an appreciable number of visitors to see the birds in such a rookery without creating undue disturbance. The nature of the problem is apt to vary somewhat with the kinds of birds in each rookery, and certainly with the degree to which the rookeries have been free from disturbances in the recent past. It is our hope and belief that as protection becomes more and more complete, the birds will become more and more tame, and less easily disturbed.

JOHN STORER'S ADVENTURE

The practical value of coordinated air and boat patrols in the vicinity of bird rookeries was brought home to John H. Storer in an exciting adventure recently. He is making a life-history film of the American egret, and was photographing these birds from a clump of mangroves in which he was concealed when he heard gun shots nearby. He jumped in the outboard-motor skiff, and found a boat but not the gunner. Unfortunately, he did not make a note of the number on the boat. Rushing back to Coot Bay, he picked up Bernie Parker and the speed boat and together they returned to the scene, but boat and gunner had, as expected, both disappeared.

That evening, Storer drove back to Miami, reported the incident to representa-

LOOK OUT FOR DDT

(From an address by John H. Baker on March 2nd at the 46th annual meeting of the Florida Audubon Society, at Winter Park.)

Broadcasting of DDT, especially by plane, is fraught with risks of disastrous consequences.

DDT is the most potent insecticide of wide application yet known to man and will undoubtedly be extensively used in combating household insect pests, such as silverfish, fleas, mosquitoes and flies. It will be advantageously used in livestock barns, warehouses and barracks; in trains, ships, planes and busses.

But spreading it outdoors is full of dangers and should be handled, if at all, only by duly constituted public authorities and then only after competent scientific investigation has demonstrated the need of local control of specific insect or insects and the wisdom of using DDT in specific concentration as the control agent.

Many insects, crustaceans, and other marine and freshwater organisms, especially fish, are easily killed by DDT, even in low concentrations, such as one-half pound per acre. Insect-eating birds are killed by heavier doses, such as five pounds per acre, and the cumulative effect of repeated sprays is as yet unknown.

History is replete with examples of man's headlong rushes into control measures with lasting adverse effects he failed to foresee. The damaging possibilities of the broadcasting of DDT outdoors call for restraint and utmost caution in its use. Let us not open another Pandora's Box.

tives of the Fish and Wildlife Service and the next morning, with the ready aid of the U. S. Coast Guard, they flew to the vicinity of the rookery and spotted a similar boat. They flew to Coot Bay, dropped notes to Parker, and guided him to the point at which the presumed violator might be apprehended. Parker did find the owner of the boat but a search of the boat and ashes of a campfire produced no evidence. The plane had given ample notice to cause its complete removal. As it is becoming well known, however, that airplane patrol is being practiced, and that it is speedy and effective, would-be violators of the law will no doubt hesitate to take a chance. It is hoped that the Society may be able to finance, before long, the acquisition of at least two light planes with pontoons and the maintenance of two full-time flying wardens.

TEN THOUSAND ISLANDS

Just north of the new federal wildlife refuge area in southwestern Florida there extends northwestward for some hundred miles an expanse of shallow waters studded with mangrove keys and known as the Ten Thousands Islands. There, for some years, your Society has been charged with responsibility for the protection of the big summer roosts at Duck Rock and Buzzard Key. Now, through recent action of the Trustees of the Internal Improvement Fund, this responsibility has been extended to cover all state-owned keys and the waters of the Gulf out to the three-mile limit, from the northern boundary of the federal refuge to a point in line with the mouth of Turner River. Here are, among other things, the principal feeding grounds of most of the roseate spoonbills that come annually from mid-March to October into Florida, from somewhere in the Caribbean.

WHISKEY STUMP

The Trustees at the same time acted to lease to your Society Whiskey Stump in Tampa Bay. On this Key there is a small cabin for the Audubon warden who guards the rookeries on nearby Green Key and the



Alafia Banks. These are colonies dear to the heart of our ever-generous friend, Herbert R. Mills of Tampa, who has for many years financed the costs of warden service both here and at Big Bird Key at Terra Ceia. Green Key is leased from C. T. Dawkins of Tampa and Big Bird Key from Mrs. Nina Washburn of Bradenton. Officials of the nearby U. S. Phosphoric Products Corporation have taken a kindly and generous interest in the birds on the Alafia Banks.

EVERGLADES NATIONAL PARK PROMOTION

At an invitation luncheon arranged by Mr. John D. Pennekamp of the *Miami Herald* in mid-February, the Florida State Chamber of Commerce assumed responsibility for a fund-raising campaign to obtain moneys to make possible acquisition by the State of Florida of private lands within the boundaries of the area agreed upon as the minimum for present federal wildlife refuge, and ultimate Everglades National Park. Presidents of the Florida Federation of Women's Clubs and the Florida Parent-Teachers Association pledged their organizations to participate in this fund-raising drive, and it was announced that Governor Caldwell would serve as chairman of the campaign.

It was also announced that recommenda-

tions of personnel would be sent to the Governor in line with a plan to re-activate the Everglades National Park Commission, a state agency which already possesses the necessary legal powers to proceed with the acquisition of private lands. As you will recall from earlier statements, the inclusion of these private lands is essential, not only from an administrative standpoint, but from that of proper protection of the animal and plant resources, which recognize ecological rather than man-made boundaries.

HOUSTON OUTDOOR NATURE CLUB PLANTING PROJECT

Members of branches and affiliates throughout the country will be interested to learn of the energetic endeavors and practical work of members of the Houston Outdoor Nature Club, who have for the past two seasons planted vegetation at the Vingt'un Islands in Galveston Bay, Texas. While this is a state sanctuary by legislative act, your Society has for fifteen years maintained warden service there to protect the nesting colony of spoonbills, egrets, ibises and herons. It is the most northeasterly point at which the spoonbills nest on the Texas coast.

In February 1945, members of the club planted on these islands approximately 1000 salt cedar cuttings, 250 oleander cuttings and 36 small hackberry trees; this in order to accomplish two primary purposes: (1) to furnish more nesting cover for the bird colony, (2) to help resist erosion, which had been proceeding apace as a result of both wind and wave action. The results were so satisfactory that in January of this year they planted there an additional 1000 salt cedars, 1250 oleander cuttings and 60 hackberry trees of from three to four feet in height. There is much enthusiasm over the fact that fully 50 per cent of the vegetation planted in 1945 is alive today; some of the oleanders have made a growth of three to four feet.

Here indeed is an outstanding example of practical conservation work in which an

affiliate of your Society has of its own initiative, and at its own expense, done much to further the chances of survival and increase at an important bird sanctuary, and has demonstrated the finest kind of cooperation with your Society and with state officials.

SUPPLY AND DEMAND

Although at the time of this writing the figures as to count of waterfowl by the Fish and Wildlife Service in late January are not yet available, reports coming to us from many parts of the country indicate that the continental inventory this past-winter is no greater than as of the year before, if as great. At the same time there has been an enormous increase in the killing demand, as evidenced by the sale of some 1,700,000 duck stamps for use during the 1945-6 legal hunting season. The comparable figure the preceding year was 1,458,628. On top of this, there seems every reason to expect a still greater demand in 1946-7, as so many men who have been in the armed services will want to go hunting.

The formula on which the waterfowl hunting regulations have for some years been based is that the restrictions on kill should be varied in the light of the figures of supply and demand. It would now appear that 1946 may well furnish the acid test as to whether this basic formula can be made to work under the democratic form of government. Will the hunting fraternity be any more ready to accept severe restrictions of hunting privileges, at a time when supply is decreasing and demand increasing, than the average wage-earner is willing to accept a cut in pay in a period of declining living costs? It is reasonable to assume that the Department of Interior will wish to base its recommendations this year on granting only such hunting privileges as the supply and demand warrants. It will be important that our members, branches and affiliates advocate and support such policy at this crucial time. Let's hope that a sound policy will not be subjected to emotional pressure on the grounds that returned veterans should be given ample opportunity to "get theirs."



The NATURE of THINGS

Comments on the new
Nature Literature —

By Richard H. Pough

CONSERVATION

PROPOSED DAMS ON THE MISSOURI RIVER WATERSHED

By Darling, Gabrielson and Bode, *National Wildlife Federation*, Washington, D.C., 1945. 5½ x 8½ inches; 32 pages, illustrated, paper covers.

This is a very thoughtful presentation of some of the major weaknesses in all the proposals which have been advanced so far for the management and use of the water resources of the Missouri Valley watershed. They point out that the best place to store and conserve water and prevent floods is in the soil on which it falls and in the marshes and ponds adjacent. Big dams would certainly appear

to be only a temporary and very costly solution in terms of both money and natural resource values. They flood vast areas of fine, fertile bottomland and then silt up rapidly and become valueless. Because of the silting and the fluctuating water levels which are inevitable if they are to iron out seasonal variations in the flow of water, they are as devoid of wildlife values as a desert. The illustrations consist of 9 of Ding Darling's wonderful conservation cartoons.

THE FOREST SITUATION IN CALIFORNIA

A Report by the California Forestry Study Committee. California State Printing Office, Sacramento, Calif., 1945. 6 x 9 inches, 189 pages, paper covers.

This report to the legislature goes into every aspect of the problem of forest land management in California. There are also brief notes on the problem in other states and countries.

CONSERVATION OF RENEWABLE NATURAL RESOURCES—SOME FUNDAMENTAL ASPECTS OF THE PROBLEM

University of Pennsylvania Press, Philadelphia, Pa., 1941. 6¼ x 9¼ inches, 200 pages, illustrated with maps and photographs. \$2.50.

This is a group of twelve papers by distinguished scientists and conservationists, presented at the University of Pennsylvania's bicentennial conference on this subject. It contains some very useful material that is not widely available in any other book. The papers are grouped under the following headings: The Natural Vegetation of the U.S. as a Guide to Current Agricultural and Forestry Practice; Climatic Cycles in Relation to the Theory and Practice of Conservation; and The Administrative Task of Conservation—Private and Public. Every naturalist with a broad interest in our country's conservation problems and their ecological background will find this book interesting reading and a valuable reference work.

A GUIDE TO BETTER CONSERVATION FOR 4-H CLUB BOYS & GIRLS

By G. W. McCullough, *Federal Cartridge Corporation*, Minneapolis, Minn., 1945. 5½ x 8½ inches, 64 pages, illustrated, paper covers. Free.

This little booklet approaches the problem from the point of view of the farm boy. The importance of conserving soil, water and forests is particularly stressed. The bulk of the material deals in detail with man's relation to such things as wild flowers, insects, snakes, game birds, birds of prey, furbearers and big game. It is full of good references to easily obtainable government bulletins. The only criticism that might be made of it is that it probably will be difficult reading for the average farm boy. It seems unfortunate that the big cats and the wolf could not have received the same tolerant treatment ac-

corded all the animals, as they are no more "killers" than any of the other carnivores.

THE RED FOX—FRIEND OR FOE

By D. W. Douglass & G. W. Bradt, *Michigan Department of Conservation, Lansing, Mich., 1945. 6 x 9 inches, 23 pages, illustrated, paper covers.*

In Michigan as in other states where the red fox population has recently reached one of its regularly recurring cyclic highs, there has been a great deal of pressure on the Department of Conservation to do something about it. In this very well-written analysis of the situation the Department presents both sides of the fox picture, tells why it believes a bounty would be a mistake and a waste of money and questions its ability to do anything effective in reducing the fox population until nature gets ready to do it. In conclusion they clearly indicate that it is their opinion that fox population levels have very little to do with the current population levels of rabbits, pheasants and grouse.

REGIONAL

THE ROCKY MOUNTAINS

By Wallace W. Atwood, *The Vanguard Press, New York, N. Y., 1945. 6 1/4 x 9 1/4 inches, 324 pages, illustrated. \$3.75.*

This is the third volume of the American Mountain Series. Along with the story about these mountains—their geology, history and inhabitants—are chapters on camping, packing and climbing. Each of the outstanding park areas in the region is briefly described. A large relief map and eight geological cross-sections are provided in the appendix.

FLORA OF OAKLAND COUNTY, MICHIGAN

By M. T. Bingham, *Cranbrook Institute of Science, Bloomfield Hills, Mich., 1945. 6 1/4 x 9 1/2 inches, 155 pages, photographs and maps. \$1.50.*

The annotated list of plants of the county is preceded by an 83 page discussion of the physical characteristics of the county and its history. Its geology, climate, soils and the original vegetation are all covered briefly before entering into a more detailed analysis of the many different plant communities to be found in the region. Two large maps come with the book, one shows the soils and the other the present surface features.

LONDON'S NATURAL HISTORY

By R. S. R. Fitter, *Collins, St. James's Place, London, 1945. 6 1/4 x 8 3/4 inches, 282 pages, 93 photographs (52 in color). 16 s.*

This is not a guide book but an extraordinarily interesting account of the way wildlife, both plant and animal, has reacted to the development of a great modern city. It starts with the geology and

virgin wildlife communities of the area that is now the site of London and then traces the changes step by step as the city grew. The effect on wildlife of a wide variety of human activities, including the war, is discussed. One of the most interesting sections of the book is that which deals with the many unique communities that occupy the various completely artificial habitats which now exist within the city-communities that are a composite of highly adaptable species both British and foreign.

THE GREAT SMOKIES AND THE BLUE RIDGE

By Roderick Peattie, *The Vanguard Press, New York, N.Y., 1943. 6 1/2 x 9 1/4 inches, 372 pages, 29 photographs. \$3.75.*

If you need anything to convince you that a visit to the Southern Appalachians will be both pleasant and interesting this book should do it. It is also a book you will want to have with you as a guide-book when you go. A good part of it deals with the history of the area and its inhabitants—the mountain people. Donald Culross Peattie has contributed chapters on the forests and wild flowers and there are others on the climate and geology. The park naturalist of the Great Smoky National Park has furnished a concise month by month summary of the seasonal aspects of the plant and animal communities of the park area.

GUIDES

TREES, SHRUBS AND VINES FOR THE NORTHEASTERN UNITED STATES

By George Graves, *Oxford University Press, New York, N. Y., 1945. 4 1/2 x 7 1/2 inches, 267 pages, illustrated. \$3.00.*

This book issued under the auspices of the Massachusetts Horticultural Society is an annotated list of woody plants both native and exotic which have values that recommend them for use in gardens, landscaping work and similar purposes in the Northeast. The notations under each species deal with the outstanding characteristics, local experience with it in the Northeast, suggestions as to sites for which it is suited and notes on its culture and propagation. Anyone planning extensive plantings in the interests of wildlife will find this book useful.

NORTH AMERICAN GAME FISHES

By Francesca La Monte, *Doubleday & Co., New York, N.Y., 1945. 4 3/4 x 7 1/2 inches, 216 pages, 73 plates (40 in color). \$3.00.*

This non-technical guide book covers the salt and fresh water fish most likely to be sought after by anglers. In all, Miss La Monte, who is on the staff of the American Museum of Natural History, treats 153 species and each is illustrated by an excellent painting. These have been reproduced in color in those cases where the fish is strongly marked or

where color is an important aid in its identification. The material is well organized under the following headings; common names, distribution, color, distinguishing characters, size, food and habits. Unfortunately, space limitations preclude any very extensive treatment of any of the topics and "habits" covers little more than the habitat in which each is found. This will be a most useful book for the average fisherman who likes to know exactly what he is catching. A very simple key is included as an appendix.

POISONOUS SNAKES OF THE EASTERN U. S. WITH FIRST AID GUIDE

By Davis & Brimley, North Carolina State Museum, Raleigh, N.C., $5\frac{1}{2} \times 8\frac{1}{2}$ inches, 16 pages, 4 color plates, 12 photographs, no covers. 10¢.

This inexpensive bulletin should be in the hands of everyone who goes off the beaten track. It certainly should be available in every camp and in the possession of scout leaders. Its photographs and color plates will serve to readily identify our few poisonous snakes and, it is to be hoped, save the lives of many harmless ones.

POPULAR SCIENCE

SCIENCE OF THE SEVEN SEAS

By Henry Stommel, Cornell Maritime Press, New York, N.Y., 1945. $5\frac{1}{4} \times 7\frac{1}{2}$ inches, 208 pages, illustrated. \$2.50.

Most of this book is devoted to the common physical phenomena of large bodies of oceanic water and the air above them. Waves, tides, currents and the nature of ocean shore-lines and bottom are covered in the first section. The next deals with optical illusions over water, the nature of the upper atmosphere, fogs, clouds and wind. A section on elementary astronomy is included and a very brief mention of the animal life of oceans.

BUTTERFLIES

By E. B. Ford, Collins, St. James's Place, London, 1945. $6\frac{1}{4} \times 8\frac{3}{4}$ inches, 368 pages, 80 photographs (56 in color). 16 s.

This is volume No. 1 in a series which is being called "The New Naturalist" in which British plants and animals are to be described in relation to their homes and habitats and portrayed in color photography. As the subject matter of this book is the biology, ecology and genetics of butterflies it should be of interest to American collectors and students even though most of the illustrative examples are British, like the Large Blue that after feeding for a time on plant material is carried by an ant into its underground nest and then allowed to live there without molestation for some 9 months as it feeds on the ant larva.



Can you Answer These?

By Anna C. Ames

1. The egg of what bird requires from fifty-one to fifty-three days for incubation?
2. What bird makes its nest behind a piece of bark on a tree?
3. What widely distributed bird has two color phases independent of age, season, or sex?
4. Which of the ducks have bills with saw teeth to enable them to catch and swallow good-sized fish?
5. What common bird builds no nest, but lays its eggs in the nests of other birds?
6. What bird was in early times considered an emblem of piety?
7. What small bird of the mountain streams walks and swims under water?
8. The young of what bird drop from their high nest in a tree trunk, bounce, and run away uninjured?
9. What bird makes the longest migratory flight, a flight of eleven thousand miles?
10. What bird of northern waters is called a "sea pigeon?"
11. What duck is the only representative of the stiff-tailed ducks in the United States and Canada?
12. What are the only North American birds that can fly backward?

Drawings by
Robert Seibert

Answers, page 128



AUDUBON MAGAZINE'S TENTH BREEDING BIRD CENSUS

REPORTS DUE AUGUST 30

Our TENTH BREEDING-BIRD CENSUS will be printed in the November-December issue this year. Send for sheet of mimeographed instructions or refer to your *Audubon Magazine*, May-June 1944, pp. 187-189. It would be a great help if all census-takers would notify us as promptly as possible of their intention to participate in this project in 1946.

LETTERS

From the Editor:

One of our favorite resorts for editorial conferences is the cafeteria across the street at the Metropolitan Museum. We always urge our visitors to come at noon-time so that we can stretch our conversations out over the lunch period. Recently a group of us were having a high old time over a cup of clam chowder, a lettuce leaf or two, and a dish of prunes, when our visitor warmed up sufficiently to say what was on his mind:



"Why you folks are rather fun!" he exclaimed. "You can laugh and even crack a joke. I supposed you were always wrinkling your brows over conservation problems!"

Heaven help me, dear reader, do you also entertain such a notion? If you do, it must be that our magazine gives a too-sober impression. Let's do something about it. Let's tuck in a chuckle or two—an amusing picture, a funny phrase—a bit of humor here and there. I've met many a wit on a field trip, haven't you? Naturemen are as gay as any others!

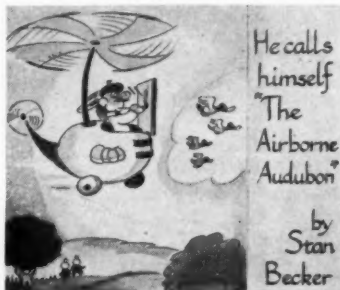
Now that Robert P. Allen is home from the wars, no telling just what might crop up in our pages. His humor ranges far and wide and he is able to enliven even scientific facts with sketches that positively roar with laughter. He is currently working on another book about spoonbills, and we print here a few items to reveal what goes on in his mind even when absorbed in an important job of ornithological research. When he was delving into the innermost secrets of spoonbill life, you will recall that he was stationed on Bottlepoint Key and his cruiser—a rowboat with sail attached—was known as "The Croc." That's the tip-off on "The Cruise of the Croc" and "The Hermit of Bottlepoint" pictured herewith.



Another candidate for the "Chuckle Department" is Stan Becker, at present indulging in some GI education down in New Orleans. Along with his cartoon came this message: "Since the study of nature, the lure of the out-of-doors and the call of the wild fascinate me, I may someday become another Audubon—who knows? I doubt if I would

try the method used in the enclosed cartoon, however!"

Perhaps we should send the note and cartoon to Mr. Vail over at the New York Historical Society, where the exhibition of original water colors by



John James Audubon is creating such a stir. If you visit New York in the coming months, be sure to allow enough time in your schedule to take in this exhibition which will be on view until July 14th.

• • •

Maybe the exhibition will cause you, as it did me, to reflect again on just what the Audubon Movement would be like if there had been no Audubon? Of course, there would have been wild-life conservation, yet the vitality which Audubon's work has given the National Audubon Society and the whole nature and conservation movement is something to think about. Conservation needs its artists as well as its scientists and philosophers. Since the very name of our Society comes from an artist, it is not surprising that the NAS has always been aware of the important contribution that artists make to this field. Before the war Roger Tory Peterson and George Sutton used to write about artists for our magazine; let's hope that they will do so again, now that the war is over. In fact, George Sutton has already told us that an article on what artists have been doing during the war years is "boiling" in his mind.

• • •

Perhaps it is not too soon to tell you that Roger Peterson and Dick Grossenheider are working on a series of covers for next year—Roger will paint birds and Dick will paint mammals. Yes, mammals—don't you think it is about time that a mammal occupied this grandstand seat in our magazine!

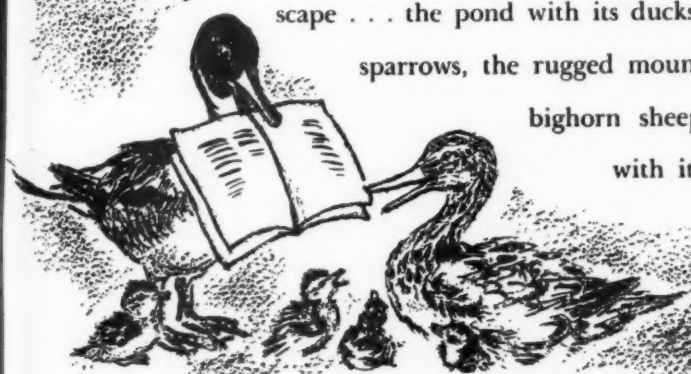
• • •

Have you noticed a change in the interior decoration of *Audubon Magazine*? During this past year, Ann Locke has been making sketches and maps to supplement the photographic illustrations. Then one day Robert Seibert of New Jersey walked in, rolled up his sleeves and sat down to help her. Since then we have been blossoming out with all

An interest that binds the whole family together



The American countryside is yours to enjoy—and to protect—so that your children will continue to partake of its healthful pleasures. Let AUDUBON MAGAZINE be the key that helps you unlock the fascinating story that is in every landscape . . . the pond with its ducks, the field with its sparrows, the rugged mountain slope with its bighorn sheep, the forest edge with its deer and grouse.



AUDUBON MAGAZINE is a magazine with a message. We are proud to admit it. A non-profit publication, it is dedicated to the Cause of Conservation—a Cause that promotes public health and happiness, improved public economic welfare and higher standards of living.



Subscribe to Audubon Magazine today!

\$2 for six bimonthly issues

NATIONAL AUDUBON SOCIETY 1000 FIFTH AVENUE NEW YORK 28



In Audubon Magazine you will find a stimulating approach to the world of nature through

Animal Life Histories—of snow geese, egrets, burrowing owls, roadrunners, petrels, grouse, wood warblers, wrens and many other birds; of deer, beaver, wolverines, foxes, chipmunks, woodchucks and other mammals.

Exploration—accounts of birds, mammals and plants in Mexico, Alaska, Hawaii, India, the Pacific Islands; accounts of American localities, such as bird islands in Maine, the mangrove keys in Florida, Okefinokee Swamp in Georgia, Bull's Island in South Carolina, Devil's Lake in Nevada, the Cranberry Glades in West Virginia—all places that every American wants to visit if he would know the delights of the American natural scene.

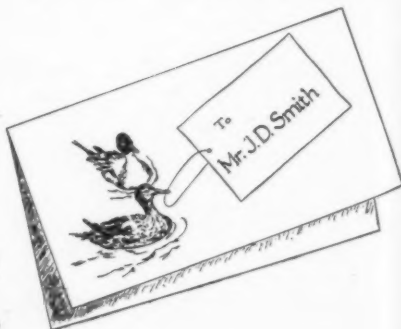
Biography—of naturalists of the past and present from Henry Thoreau to Ira Gabrielson, Director of the U. S. Fish and Wildlife Service; of other vibrant personalities as much a part of this field as nature itself.

Human Interest Stories—of backyard bird-attracting stations, of adventures with sparrows, crows, squirrels, woodchucks as household pets; of Jerry, the brown thrasher that learned to talk; of Snobber, the New York City sparrow that became famous as the companion of a school boy.

Music of the Out-of-Doors—of listening to bird song, to the murmur of the wind in the trees, the roar of the surf, the cry of shore birds, the singing of trout streams over pebbles, the drone of the bees, the click of insects and the patter of rain.

Pictures—from thirty to forty illustrations appear in each issue—photographs made by the best wildlife photographers in the United States.

This card (4" x 5" and with appropriate message inside) bearing your name and the name of the friend to whom you wish to send a gift subscription, will be mailed upon receipt of your instructions.

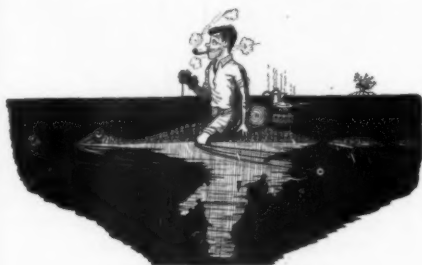


Read
Audubon Magazine
yourself and share its
facts and pictures with your children.
Send it as a gift to all your friends.

kinds of new talent. SuZan Swain, whose training began in the University of Colorado in the Department of Fine Arts and in the Biology Lab, made the layouts, lettering and drawings for "The Valiant Robin" in the last issue and for "Birds have Zippers" in this issue. Vera Andrus (of the Metropolitan Museum) did the scratchboard drawing for "Carnival in Spring." Her work has been hung in many exhibitions, has appeared in books, and her Christmas cards, distributed by the American Artists Group, sell in the thousands. Gillian Quennell (daughter of the famous English essayist of that name) lends a lighthearted touch. Those "Bird and the Book" drawings just go to show that you don't always have to cling to the A.O.U. conception of what a bird looks like to illustrate an article in *Audubon Magazine*.

• • •

Not long ago, the president of one of our affiliated Audubon clubs asked for a circular on *Audubon Magazine* to mail out with annual dues notices. It was the first request of that kind to come to this desk, so a circular was prepared, and *pronto!* There it is, on a nearby page. Printed on both sides, it is a one-sheet affair so that it can be conveniently mailed with other enclosures. It is

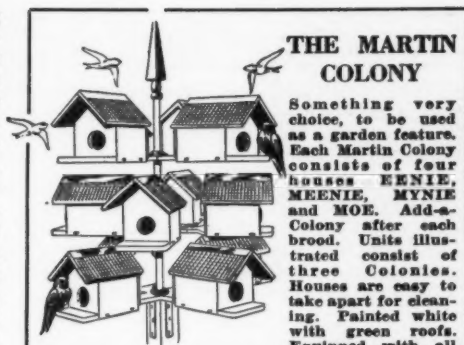


The Cruise of the Croc

yours for the asking—if you are interested in promoting our sheet. Let us know how many you can use.

Or don't you think our magazine is *good enough* to promote with your members? If it isn't, send us your criticisms and suggestions. It takes time, of course, to change and improve a publication, and you may think that your suggestions are ignored if not immediately adopted. But, believe me, they receive every consideration. An idea may spend years, sometimes, in search of an author—but the search goes on!

Take "In Coats of Many Colors" for instance. No one actually suggested such an article, but many of you have written in for information about albinism. An answering letter from this office always seemed pitifully inadequate, since it could not be of article length, which was what such a subject required. For two years, this subject has been in



THE MARTIN COLONY

Something very choice, to be used as a garden feature. Each Martin Colony consists of four houses: EENIE, MEENIE, MYNIE and MOE. Add-a-Colony after each brood. Units illustrated consist of three Colonies. Houses are easy to take apart for cleaning. Painted white with green roofs. Equipped with all hardware and fittings necessary for attaching to heavy post or any upright. (Heavy post may be secured from local lumber dealer.)

Conventional type Martin Houses (weighing 50 lbs. or more) are very expensive to erect, requiring special facilities and gear not usually part of home or farm equipment, and 3 or 4 men a day or more. Our Martin Colony, as it is in sections, is simple and easy to attach to top of post or vertical by one man in a couple of hours. Therefore cost in place, less than usual type. Each half section weighs only 8 pounds.

No. MC1, Starter Colony, price..... \$20.00
No. MC2, Add-a-Colony, price..... 20.00

HYDE BIRD FEEDER CO.
Somerville 45, Massachusetts

BINOCULARS

*for greater enjoyment of
bird study*

Coated lenses—just released (tax included)

Bausch & Lomb.....	7x50	.....	\$194.40
Wollensak	6x30	.....	87.00
Wollensak	8x30	.....	99.00
Universal	6x30	.....	102.00

Not coated

Oppler Field Glass.....	4x40	.....	21.00
Rambler Field Glass.....	4x35	.....	18.00

USED BINOCULARS Reconditioned & accurately described

Zeiss *IEA.....	7x50 used	..	\$150.00
Zeiss IEA.....	8x40 used	..	120.00
Zeiss IEA.....	6x30 lite used	..	78.00
Zeiss IEA.....	6x30 used	..	72.00
Westinghouse (B&L design)			
IEA	6x30 good	..	90.00
B&L IEA (brown leather) ..	6x30 good	..	78.00
B&L IEA	6x30 like new	..	114.00
Hensoldt dialyt center focus ..	6x30 good	..	90.00
Hensoldt dialyt center focus ..	6x42 like new	..	150.00
Hensoldt Porro lightweight ..	6x30 like new	..	90.00
Hensoldt Porro lightweight			
IEA	7x56	.....	135.00

*IEA—Individual Eye Adjustment

HAVE YOUR BINOCULARS COATED. Clean lenses, coat lenses, align prisms—\$24.00 to \$35.00 according to size & power.

Schoenig & Company, Inc.

8 EAST 42ND STREET, NEW YORK
OPTICIANS

CLASSIFIED

ENTIRE LIBRARIES or small collections of Natural History books purchased at liberal prices. Catalogs issued. *Nada Kramar, Natural History Bookseller, 70 Fifth Avenue, New York 11.*

ASSISTANT wanted for small established bookshop, specializing in books relating to the natural sciences, in New York City. In reply please give age, education, experience and starting salary. *Box 1, Audubon Magazine.*

BINOCULARS, UNIVERSAL 6 x 30 LIGHT-WEIGHT, prismatic. Excellent for bird study. New miracle "coating" increases light transmission, etc. \$85.00; tax \$17. Shipped COD subject examination. Descriptive circular free. *RICKA, 2285a East 22nd Street, Brooklyn, N. Y.*

NATURE SETS ILLUSTRATED IN COLOR. *Nature Encyclopedia*, edited by Clyde Fisher, 5 Vol., 952 pages, 700 illustrations, 200 in color, \$6.00. *Nature Lovers' Library*, 6 Vol., 8½ x 11½, 2000 pages, weight 20 lbs., lives and habits 3000 species fauna, 1000 species illustrated, 300 in color, \$19.50. *The Nature Library*, 7 fabrikoid Vol. flora and fauna, 1891 pages of which 288 are in color, \$10.00. *Smithsonian Series*, 12 Vol. red Buckram, 5000 pages, 1800 illustrations, \$66. (Literature free). Terms: Remittance with order, we deliver free. Full refund for sets returned within ten days. *Literary Mart, 8 East 33rd St., New York 16, N. Y.*

SONGBIRD SANCTUARIES

By Roger T. Peterson

With tables of trees, shrubs and vines attractive to birds. 32 pages.

15¢ prepaid

NATIONAL AUDUBON SOCIETY

George S. White & Co., Inc.

116 JOHN ST., NEW YORK 7, N. Y.

Insurance Brokers

Specializing in providing proper coverage and reducing costs for thousands of satisfied customers. Cameras and binoculars insured.

pursuit of an author. Finally, your letters were bundled together and sent to Maurice Brooks with a plea for enlightenment. Just look what he has done with the subject—don't you think it a stimulating discussion?



The Hermit of Bottlepoint

You see, your letters do pay dividends! An author may be cold to just another suggestion from an editor—but backed up by a pile of letters indicating real reader-interest, the author is likely to become inspired!

Many of you have suggested that we have color—inside the magazine and full color on the cover. "Well, you don't have to go searching for that," you say. "Just do it." Ladies and gentlemen—it costs money! How about using those circulars—help us increase the circulation; that reduces the unit cost and releases funds for color! (But never forget that the main advantage in greater circulation is that the conservation message thus reaches and influences more people.)

• • •

Funds! Since such a word has been mentioned at all, let's clear up another point with which it is concerned. Various people who pay the extra dollar to receive Section II of *Audubon Magazine* (entitled *Audubon Field Notes*) want to know why we continue to suggest that they join a "Christmas Count Club" at 10¢, to help "defray the expense" of printing the results of the Christmas Count. Here's the

answer—so few people subscribe to Section II that the receipts pay only three-fifths of the cost of production.

• • •

What's the difference between *Fulica atra* and *Fulica americana*—or is a coot just a coot to you, as it is to me? Well, your American bird has white undertail coverts—as did the coot pictured in Part I of "London Birding." Allan got his pictures mixed, I didn't know the difference—and so the wrong coot was passed off on you! We apologize! And, at the same time, we wish to thank those sharp-eyed birdmen who caught the mistake and told us about it.

EAK

• • •

To the Editor:

I regard *Audubon Magazine* as my favorite magazine, and don't want to miss an issue, or have my files broken. Recently I reread many of the articles published during the last two years.

R. F. MILLER

Baldwin City, Kansas

• • •

To the Editor:

The illustrator of "The Valiant Robin" in the January-February issue must be psychic. She has drawn Pete's right leg exactly as Pete carried it for a long time. She has drawn the tail-brace exactly as Pete used it, and the attacking bird precisely as he made a violent threat to Pete's life.

WALTER S. FUNNELL

Yonkers, N. Y.

• • •

To the Editor:

In some old newspaper files I recently came across an item which might be of interest to your readers. It is from the *Hampshire Gazette* (Northampton, Mass.) Nov. 1, 1853, and reads as follows:

"A squirrel hunt came off in Worthington last week. There were sixteen men on each side and the whole number of squirrels killed was 1375 and of game of all kinds 14,900."

Worthington is a village in the hills a few miles northwest of Northampton.

MILLCENT TODD BINGHAM

Washington, D. C.

• • •

To the Editor:

We have a small feeding board, for chickadees only, swung tight against the southeast window of our living room. Although I try to keep the water thawed out, ice occasionally forms. Such was the case once when I pressed close to the window pane to watch a little fellow feed. He took seed after seed until he was satisfied, then deciding to have a drink, he delivered a rapid succession of mighty blows (for a chickadee) that sent ice particles flying against the window pane. In about a second he had

the Birds will soon be here!

Don't miss the pleasure of having a wren or a bluebird as a neighbor for the summer . . .



Lifetime Bird Boxes

These boxes are built to last a lifetime. Copper ridge, removable sides and adjustable hole diameter.

H1—Wren to Nuthatch.....	\$3.50
H2—Same with glass side for observation	4.50
H3—Hairy Woodpecker to Crested Flycatcher	4.95
H4—Flicker to Screech Owl.....	4.95
H5—Wood Duck to Barn Owl...	7.95



Standard Bird Boxes



are similar to the lifetime boxes but of simpler construction.

V1—Wren	\$2.50
V2—Chickadee	2.50
V3—Bluebird	2.50
V4—Open shelf with roof for Phoebe, Robin, or Barn Swallow	2.50
V5—Hairy Woodpecker	4.50
V6—Flicker	4.50

If you wish to build your own houses, send for circular on *Bird House Construction*—5¢

NATIONAL AUDUBON SOCIETY

NATURE STUDY

A group is being organized for the study of natural history, especially birds, under the leadership of Chas. H. Rogers, well-known ornithologist and Curator of Princeton Museum of Zoölogy.

A veritable paradise for nature lovers, Elk Lake is located in the heart of thousands of acres of wild, unspoiled forest land, abounding with native plants, birds and other wildlife.

Excellent hiking trails, also swimming and canoeing. Main camp and cottages with hotel service. For further information address

C. D. Davis
Elk Lake Camps
Blue Ridge, N. Y.

or
Chas. H. Rogers
20 Haslet Ave.
Princeton, N. J.

The Wilderness Society

invites you to become a member and a supporter of its work for the preservation of our few remaining wilderness areas. An illustrated quarterly, **THE LIVING WILDERNESS**, is sent to all members. Dues are only \$1 a year. **THE WILDERNESS SOCIETY**
1840 MINTWOOD PLACE N. W., WASHINGTON 9, D. C.

Are you interested in
bird migrations?



Then read

AUDUBON FIELD NOTES

Published as Section II of *Audubon Magazine*, the six issues of *Audubon Field Notes* contain recent coast-to-coast highlights of the annual migrations of North American birds, as well as important bird counts regularly taken throughout Canada and the U. S. They will help you learn where our birds are, where they are most abundantly recorded, and how their numbers are changing. The schedule of publication is as follows:

Jan.-Feb.	Fall Migration
Mar.-Apr.	Christmas Count
May-June	Winter Season
Jul.-Aug.	Spring Migration
Sept.-Oct.	Nesting Season
Nov.-Dec.	Breeding-bird Census

If you wish to receive Section II, send \$1.00 extra with your subscription or membership. Membership includes the National Edition of *Audubon Magazine* but does not include *Audubon Field Notes*.



Answers to questions, page 121

- (1) Shearwater, (2) Brown creeper, (3) Screech owl, (4) Mergansers, (5) Cowbird, (6) Pelican, (7) Water ouzel, (8) Wood duck, (9) Arctic tern, (10) Black guillemot, (11) Ruddy duck, (12) Hummingbirds.



drilled a tiny hole through the ice and was drinking to his heart's content.

I immediately measured the layer of ice and found that it was a little over an eighth of an inch thick. From the ease with which he turned the trick, I am sure he can make a much better record for himself.

SAM THORN

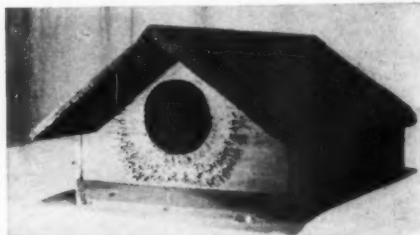
Milwaukee, Wisconsin

To the Editor:

I should like to compliment you on a splendid publication. It seems to acquire a higher measure of perfection with every issue. Although it is a fine magazine I would like to see a few minor changes. I think that the cover should be a painting or drawing instead of a photograph. (This is no reflection on Mr. Cruickshank whose work I admire very much). I would also like to have a column devoted entirely to the fine art of photographing birds. It could be conducted by some such talented and experienced man as Allan D. Cruickshank, S. A. Grimes, Ralph E. Lawrence or W. Bryant Tyrrell.

FRANK SARTWELL

Washington, D. C.



To the Editor:

In our acre (mostly wildlife preserve) at the edge of Fort Wayne, many interesting things happen. I am sending you a picture of a little house put up as a shelter for I knew not what, but which many creatures used, including red and fox squirrels, opossum and even bumblebees. But the one that amused us most was a little screech owl which would sit for an hour at dusk with its head sticking out the opening and with a tight grip on the edge, so tight that the claw marks made the design around the hole you see in the picture. In measuring the depth of these claw marks we found some to be $\frac{1}{4}$ " deep and the fact that they extended nearly all around seemed curious to us for it did not seem to matter if the owl's body was nearly up-side-down—although the head was always beak downward.

We are members of the state and local Audubon Societies and look forward with pleasure to the Audubon Screen Tours that appear here this year.

W. W. WHITE

Fort Wayne, Ind.

BACK NUMBERS WANTED

Section I

We shall appreciate having your unwanted copies of the following magazines returned to us:

May-June 1945	Mar-Apr. 1940
July-Aug. 1945	July-Aug. 1940
May-June 1944	Sept-Oct. 1940
Jan.-Feb. 1943	May-June 1939
Mar-Apr. 1943	Mar-Apr. 1938
May-June 1943	May-June 1938
Mar-Apr. 1942	Mar-Apr. 1937
Sept-Oct. 1942	Nov-Dec. 1937
All six issues of 1941	Mar-Apr. 1935
Jan-Feb. 1940	Mar-Apr. 1925

Section II

The issues of Section II as noted below are out of stock. If you have copies which you do not want, we shall appreciate having them returned to this office.

Season Reports

Jan.-Feb. 1945	Mar.-Apr. 1942
May-June 1945	July-Aug. 1942
May-June 1944	Nov.-Dec. 1942
Nov.-Dec. 1944	Mar.-Apr. 1941
Mar.-Apr. 1943	May-June 1941
May-June 1943	July-Aug. 1941

Breeding Bird Census

Sept.-Oct. 1944	Sept.-Oct. 1941
Sept.-Oct. 1942	Sept.-Oct. 1940

Christmas Count

Jan.-Feb. 1944	Jan.-Feb. 1942
Jan.-Feb. 1943	Jan.-Feb. 1941
Jan.-Feb. 1940	

NATIONAL AUDUBON SOCIETY

AUDUBON POST CARDS

Let the yellow-throat, hummingbird, indigo bunting, wood thrush, oriole, tanager, grosbeak, kingbird, catbird or redbird carry a message to your friends. Cards are in color with space on back for message and address, 10 cards—20¢. Add 3¢ for postage. Sets cannot be broken.

NATIONAL AUDUBON SOCIETY

AT LAST

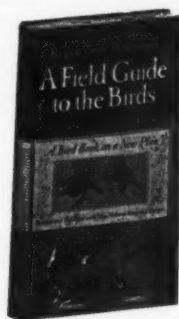
2 x 2 Bird Slides

150 bird portraits in full color—each slide is made directly from an original painting by Major Allan Brooks.

\$5.00 per set of twenty
\$35.00 for the entire 150

List of birds in each set sent on request

NATIONAL AUDUBON SOCIETY



Nature Books

Add these books to your library — buy them for your friends as gifts.

- ☐ FIELD GUIDE TO THE BIRDS.. \$2.75
(*Eastern Species*)
by Roger Tory Peterson
- ☐ FIELD GUIDE TO THE WESTERN BIRDS \$2.75
by Roger Tory Peterson
- ☐ THE ROSEATE SPOONBILL..... \$1.98
by Robert Porter Allen (*paper bound*)
- ☐ IVORY-BILLED WOODPECKER.. \$1.98
by James T. Tanner (*paper bound*)
- ☐ MODERN BIRD STUDY..... \$2.50
by Ludlow Griscom
- ☐ SON OF THE WILDERNESS..... \$3.50
The Life of John Muir
by Linnie Marsh Wolfe
- ☐ THE LOST WOODS..... \$4.00
by Edwin Way Teale
- ☐ ONE DAY ON BEETLE ROCK.. \$2.75
by Sally Carrigher
- ☐ WILDLIFE REFUGES..... \$4.00
by Ira N. Gabrielson
- ☐ MEETING THE MAMMALS..... \$1.75
by Victor H. Cahalane
- ☐ BIRDS OF THE SOUTHWEST PACIFIC \$3.75
by Ernest Mayr
- ☐ MAMMALS OF THE PACIFIC WORLD \$3.00
by T. D. Carter, J. C. Hill,
G. H. M. Tate
- ☐ NATIVE PEOPLES OF THE PACIFIC WORLD \$3.00
by Felix M. Keesing
- ☐ FLORIDA BIRD LIFE..... \$4.25
by Arthur H. Howell
(*illustrated in color*)

Garden Sticks

about 2' tall,
brightly colored and handpainted. 6 in
a box—\$3.95.



NATIONAL AUDUBON SOCIETY

Audubon Nature Camp

MEDOMAK, MAINE

Teachers,
Youth Leaders,
Members of Bird & Garden Clubs
& other Adult Groups!

Above: Osprey, Below:
Starfish, Harbor Seal,
Monarch butterfly



Enjoy two weeks outdoors by the sea this summer, observing living plants and animals in their natural habitats, storing up a host of interesting experiences, and discovering new and fascinating ways of presenting nature appreciation and conservation to children in your classes, to scout and camp fire groups or developing a conservation program for your garden club, bird club or other natural history group next fall.

Enroll now for one or more of the following two-week sessions:

June 14—June 27 June 25—July 11 July 12—July 25

August 2—August 15 August 16—August 29

The Audubon Nature Camp re-opens this summer for its 8th season. There will be the usual program of field trips under the leadership of most of its old staff now released from the armed services.

The Camp operates at cost. *The total fee, \$65.00 for one two-week period* covers tuition, board, lodging and transportation on regularly scheduled field trips.

Each of the two-week periods offers field classes in birds, plants, insects, marine life, and nature activities.

Only fifty campers can be accommodated in any one two-week enrollment period. To avoid disappointment, register now for the session of your choice.

For an illustrated folder describing the Camp and its program write to

NATIONAL AUDUBON SOCIETY
1000 Fifth Avenue, New York 28, N. Y.